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JOURNAL
OF THE
AMERICAN PHARMACEUTICAL ASSOCIATION

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THE SEVENTIETH ANNUAL CONVENTION OF THE AMERICAN PHARMACEUTICAL ASSOCIATION WILL BE HELD IN CLEVELAND, OHIO, DURING THE WEEK OF AUGUST 14, 1922.

The 1922 meetings of the American Conference of Pharmaceutical Faculties and the National Association of Boards of Pharmacy will also be held in Cleveland during Convention Week

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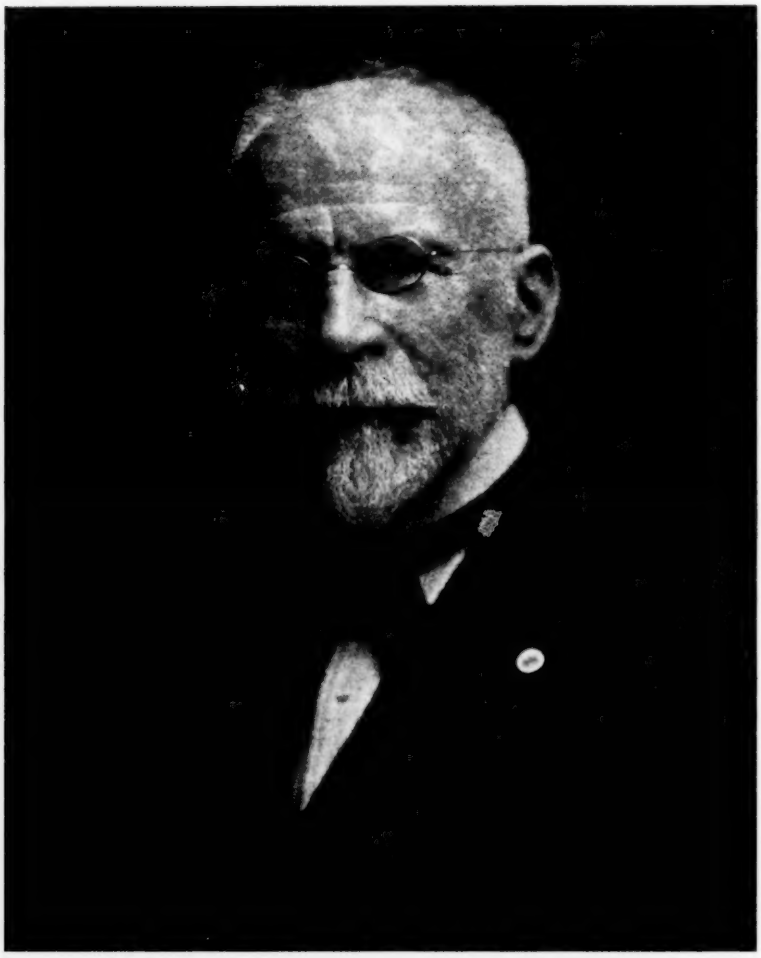
BROOKLYN, N. Y.

Affiliated with the American Pharmaceutical Association in 1872



THOS. D. McELHENIE

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL. XI MAY, 1922 No. 5

THOMAS DE ARMOND McELHENIE.

In 1872 the American Pharmaceutical Association had a membership of less than one thousand; of that number one hundred and twenty-four members were present at the Cleveland meeting. Twenty-two remain on the membership list who were members in 1872, and seven members who, according to the list in Volume No. 20 of the Proceedings, A. Ph. A., attended the Cleveland meeting, are living. They are: Joseph L. Lemberger (1858), John F. Hancock (1863), Thomas N. Jamieson (1869), James S. Robinson (1869), Lewis P. Ohliger (1871), George H. Schafer (1871); and the youngest of the number is the subject of this sketch, Thomas D. McElhenie (1872).

Other members who joined in 1872 or earlier are: Charles F. Fish (1866), James Vernor (1866), Charles F. Chandler (1867), John McKesson, Jr. (1867), A. W. Miller (1868), C. A. Weidemann (1868), O. F. Fuller (1869), William H. Rogers (1869), J. U. Lloyd (1870), W. H. Wickham (1870), Solomon Boehm (1871), George A. Crossman (1872), E. L. Patch (1872), F. B. Power (1872); the total representing over 1100 years of Association membership, and more than 1500 years of life and work.

A sketch of the life of Thomas D. McElhenie is woven into his "Reminiscences," read before the Section on Historical Pharmacy in 1916 and printed in the Jour. A. Ph. A., 6, 276–280. He entered the drug business in 1865, engaging with Zimmerman & Company, wholesale and retail druggists of Wooster, Ohio; in 1870 he matriculated at the Philadelphia College of Pharmacy, and graduated in 1872. During the college years Mr. McElhenie was employed by Lancaster Bros., successors to William Hodgson, who for a time was partner of Daniel B. Smith, first president of the American Pharmaceutical Association.

After graduation Mr. McElhenie returned to Ohio and accepted a position as chemist with Benton, Meyers and Canfield of Cleveland, but an attack of typhoid fever soon thereafter compelled his return home. In 1874 he engaged with George C. Sands, New York, successor to Prof. P. W. Bedford, and in 1876 he bought the store which he developed into his present business, March 27 concluding the forty-sixth year of his ownership. Later, during the same year, Mr. McElhenie was married, at Wooster, Ohio, and last July it was our sad duty to report the demise of the life companion, who had shared his joys and sorrows for more than forty-five years.

Mr. McElhenie hopes to attend the meeting in Cleveland and join with those who fifty years ago met in this city; only a very few of them will be permitted to make the trip, but these are looking forward to the occasion; a "dine together" event will be part of their program.

The sketch mentioned was published so recently that the readers are referred to it for data in the life of our fellowmember. E. G. E.

CLEVELAND HIGH LEVEL BRIDGE

The Detroit-Superior High Level Bridge connects Detroit and Superior Avenues. The bridge is 2880 feet in length, 81½ feet high and 96 feet above the Cuyahoga River.

The American Pharmaceutical Association will meet in Cleveland during the week of August 14.

CORRECTION.

Editor, JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION:

Dr. E. Samson, of Schering & Glatz, has written me that in my article in the JOURNAL (February 1922), in speaking of the therapeutic field of Cinchophen, or Atophan, I failed to bring out the fact that this substance has been recommended for the treatment of rheumatism as far back as 1911. He has sent me some early brochures issued by Schering & Glatz, which demonstrate quite clearly that this is true. I am very glad to bring this to the attention of the readers of the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

The writer has known that Atophan, or Cinchophen, has long been used, and very extensively, for "rheumatism," but is still of the opinion that its distinctive value in the treatment of acute rheumatism (rheumatic fever) has never been so definitely demonstrated in this country as in the papers contributed by such men as Chace, Hanzlik and Myers, published in *The Journal of the American Medical Association* during 1921. It was these papers that he had in mind when he referred to the lately demonstrated value of Cinchophen in "rheumatism."

I also take this occasion to point out that on page 101 there was a misprint. The word "Atophan" was made to read "Citophen." This was probably due to the poor handwriting of the undersigned. Of course the word "Atophan" was what I had in mind. The trade-mark "Atophan," I may say, is owned in the United States, by Schering and Glatz. (Signed) ALFRED S. BURDICK, M.D.

CHICAGO, ILL.

EDITORIAL

E. G. EBERLE, EDITOR 253 Bourse Bldg., PHILADELPHIA

OFFICIAL HEADQUARTERS AND PERMANENT HOME OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

A quotation may be relevant to a subject under discussion while the source or origin of it is not. This is true of lines that have come to mind in preparing this comment; they are: "If it were done, when 'tis done, then 'twere well it were done quickly." The words imply that there should be no delay; the best time for doing is while much can be accomplished; that enthusiasm is necessary for achievement and essential for enlisting the interest of others.

Annually, for many years, the question of providing a permanent home for the American Pharmaceutical Association has been brought up and discussed at the annual meetings, in pharmaceutical publications, and made one of the important suggestions, if not recommendations, of several presidential addresses. Never before has the signal step of providing ways for accomplishing the purpose been taken so that means might be provided for crowning the effort with success.

Every section of the country is represented on the Special Committee,* but the Committee can only direct, instill enthusiasm, and carry on the effort for the promotion of which they were appointed. There is more than a possibility of having subscribers from other organizations, corporations and individuals whose attachment for the American Pharmaceutical Association is strong and who recognize its greater possibilities in subserving pharmacy.

While the letter of Chairman J. H. Beal has gone out to the members only recently, some replies have come in, and the names of these donors, up to April 28th, are listed under "Societies and Colleges." The letter carries a message to every A. Ph. A. member and pharmacist; as a matter of record and reference, the greater part is included in this comment, confident that responses will enable the Committee to render a gratifying report at the Cleveland meeting of the Association.

"The long discussed project of securing a building to serve as Official Headquarters and Permanent Home of the American Pharmaceutical Association is now in process of accomplishment.

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* American Pharmaceutical Association Headquarters Building Special Committee: J. H. Beal, *Chairman*, Summer address, 801 W. Nevada St., Urbana, Ill.; Winter address, Camp Walton, Fla.; John G. Godding, 278 Dartmouth St., Boston, Mass.; Leonard A. Seltzer, 60–64 Adams St., W., Detroit, Mich.; E. L. Newcomb, 719 6th Ave., S. E., Minneapolis, Minn.; Chas. H. LaWall, 636 Franklin Square, Philadelphia, Pa.; H. S. Noel, 4335 Park Ave., Indianapolis, Ind.; Wm. B. Day, 701 S. Wood St., Chicago, Ill.; Jeannot Hostmann, 115 West 68th St., New York, N. Y.; W. H. Ziegler, 213 Rutledge Ave., Charleston, S. C.; Joseph L. Lengfeld, 1505 Gough St., San Francisco, Calif.; E. F. Kelly, Lombard & Greene Sts., Baltimore, Md.; H. M. Whelpley, 2342 Albion Place, St. Louis, Mo.; Geo. W. McDuff, 2712 Magazine St., New Orleans, La.; F. H. Freericks, 1004 Mercantile Library Bldg., Cincinnati, O.

"The building is intended to contain offices for the Editor of the JOURNAL and General Secretary, laboratories for pharmaceutical research, and to house the historical collections of the Association, pharmaceutical library, etc.

"The laboratories will be available for the use of advanced students working out Pharmacopoeial and National Formulary problems, and other problems of pharmaceutical importance. In the historical museum will be collected the scattered treasures of American pharmaceutical history which otherwise would be dissipated and lost to the uses of posterity. The historical material already owned by the Association is now divided among several institutions that are taking care of it temporarily, while other materials of equal or greater value cannot be accepted by the Association because there is no place in which to store them safely.

"The building as a whole will be a monument to American pharmacy and pharmaceutical workers as well as to the American Pharmaceutical Association, and a source of pride to all those interested in any division of pharmaceutical work.

"The city in which the building is to be erected will not be decided upon until sufficient funds have been pledged for its erection, and will then be selected in some appropriate manner by the Association, doubtless after consulting the wishes of the subscribers to the Fund.

"All receipts from subscriptions will be deposited at interest, and kept intact until sufficient has been collected for the completion of the project. Any money not expended upon building and equipment will be invested as a permanent Endowment Fund for the maintenance of the plant.

"The Committee has the assurance of substantial aid from outside sources, *provided the members of the Association subscribe with sufficient liberality.*

"Every member of the Association should feel called upon to make some contribution, if only a small one. Please make your subscription as liberal as you feel that you can afford to do. If any subscriber cannot meet his promise at the date stated, the time will no doubt be extended by the Association.

"All subscriptions will be published in the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION and members will be kept posted as to the progress of the work by frequent notices in the JOURNAL."

The possibilities and opportunities afforded by the laboratories to be provided for research and other work of investigation and on the Standards, the importance of the endeavor in general, that must and will bring about a better recognition of the service of pharmacy, and the establishment of a library and the preservation of historical material, should incite the greatest interest in this undertaking, worthy of the support and promotion of the American Pharmaceutical Association, its membership, coöperators and friends. Having started the movement we cannot stop short of accomplishment, therefore, *repetatur:*

"If it were done, when 'tis done, then 'twere well
It were done quickly."

E. G. E.

PHARMACEUTICAL ETHICS.

WILLIAM Procter, Jr., in an address delivered before the American Pharmaceutical Association during the first decade of its existence, gave expression to a sentiment which deserves more than passing consideration at this time:

"Pharmacy partakes of the character of a liberal profession and demands of its votaries that they uphold its ethics even at the sacrifice of gain."

No profession or calling makes true progress save through the labors of the members who exemplify its highest ethical principles and practice. The profession of law commands respect on account of the high ethical standards upheld by the majority of the members of the bench and of the bar and in spite of the shysters and scalawags who infest it in all communities.

Medicine has attained its present eminence through the constructive work of a minority of its practitioners, although quacks and charlatans have hampered it in all ages.

Pharmacy as a profession has never "found" itself. There have been and are organizations whose codes are irreproachable examples of high and noble idealism but in many cases the growth has been so rapid and the trend of thought and practice so different from a generation or two ago that the existence of a code of ethics is not even suspected by the majority of the membership.

No healthy growth can take place under such conditions. If pharmacy is to attain its desire to be respected as a profession, it must be through a realization and open acknowledgment of its responsibilities. These responsibilities have been entrusted to its members, by the public, along with certain privileges which give an advantage to the possessor over the members of other callings which are purely mercantile.

The slogans "Try the drug store first," and "Your druggist is more than a merchant," and others which have sprung up recently, are an exemplification of the attempt to capitalize the professional reputation of the ideal pharmacist. There is an implied superiority in these phrases which is pleasantly convincing to many, but unless the drug store is *worth* trying first or unless your druggist *is* more than a merchant, the final outcome will be a net loss instead of a gain.

The pharmacist who buys his prescription drugs, chemicals, and preparations at the lowest possible price without comparing quality and with no regard for official standards, is the one who is a menace to ethical and professional pharmacy.

There is greater profit, of course, in the sale of a gallon of ice cream or of an expensive bottle of perfume than there is in the dispensing of a gallon of lime water or the compounding of a difficult prescription, but should the question of comparative profit ever enter into a transaction which involves human health?

There is no real conflict between good ethics and good business, and there is no intent at disparagement for the seller of the ice cream or of the perfume if he pays conscientious attention to his professional duties.

If every pharmacist were to proceed in all transactions having to do with the purchase, sale, compounding or dispensing of medicines as though the health and safety of a loved member of his own family were at stake there would be little need for a code of ethics, for in their essence all codes of ethics may be epitomized in "Do unto others as you would have others do unto you."

C. H. LaWall.

SEVENTIETH ANNUAL CONVENTION, AMERICAN PHARMACEUTICAL ASSOCIATION IN CLEVELAND, OHIO.

BY EDWARD SPEASE, LOCAL SECRETARY.

The seventieth annual convention of the American Pharmaceutical Association will be held in Cleveland, during the week of August fourteenth. This will be the first time the convention has met in Cleveland since 1872; it is the golden anniversary.

The headquarters will be at the Hotel Statler, which is located in the very heart of Cleveland and within five or ten minutes' walk of all the principal hotels and all the larger business houses. Plans have been perfected with the hotel to mail cards to every member of the Association. These cards will give the hotel rates, and when the hotel receives the return card the room will not only be reserved but assigned to the individual and he will be notified of his room number, so that this room will be ready for him when he arrives. There will be no other convention in the Statler Hotel during this week. It will devote its entire energy to entertaining our Association, the American Conference of Pharmaceutical Faculties and the National Association of Boards of Pharmacy.

Plans have been partially perfected to date for a splendid entertainment program, as well as that of the business sessions. There will be a report of the Committee on Reorganization of the Association, which will be received and discussed at this convention. The House of Delegates, A. Ph. A., will present its first report on coöperative work with the state associations.

This is the one pharmaceutical convention of the year that all branches of the drug business attend. There are administrative, executive, legislative, scientific, manufacturing, and commercial sections. Every state association, every manufacturing house of any consequence, every school, and every state board of pharmacy should have, and usually does have, a representative at this convention. This is the one great gathering of American pharmacy.

The easy access to the lake port resorts is an added feature; many will come and take their vacation just prior to or just subsequent to this convention, at one of the lake ports. Cedar Point, one of the longest sand beaches in the world, is only a few hours' distant by boat, and here you can spend the week-end after the convention. For fresh water bathing it cannot be excelled.

Make your preparations to come.

Chairmen of Convention Committees: A. F. Conrad, Automobiles; E. D. Davy, Program; A. B. Ejbl, Entertainment; C. H. Flandermeyer, Transportation; W. H. Hagemeister, Finance; L. A. Lesser, Badges; Jacob Lustig, Registration; E. R. Selzer, Hotels; E. G. Winger, Publicity. Convention Officers: L. C. Hopp, *Honorary Chairman;* O. E. Muhlhan, *Chairman*, 10500 Cedar Avenue; Edward Spease, *Local Secretary*, 2045 Adelbert Road; H. F. Guenther, *Treasurer*, 16139 St. Clair Avenue.

SOME CONSTITUENTS OF *VIBURNUM OPULUS*.

BY FREDERICK W. HEYL.

The dried bark of *Viburnum opulus*, known also as cramp bark, was official in U. S. Pharmacopoeia VIII, along with *Viburnum prunifolium* (black haw). Of these the former does not appear in the latest revision but has been relegated along with its fluidextract to the National Formulary.

The bark is used in large doses (2.0–4.0 grams) in considerable quantities in pharmaceutical work, particularly for the preparation of several elixirs. A number of preparations in tablet form are prepared, but these probably lack part of the valerianic acid of the drug. This drug is used medicinally as an antispasmodic or nervine, especially in menorrhagia, and despite some adverse comments upon its use, the drug is a component of some preparations on the market, and physicians continue to prescribe galenicals of *Viburnum opulus*, apparently with desired results.

Sumbul root remains official, although so far as chemical investigation assists our understanding of the therapeutics, it is akin to Viburnum.

Our present information concerning the drug may be summarized as follows: Chevreul[1] found valerianic acid, and this was confirmed by L. von Moro.[2] Krämer[3] reported the presence of tannic acid, a bitter principle (viburnin), brown resin acid, chlorophyll, wax, gum, pectin, potassium malate, calcium malate, calcium sulphate, iron oxide and magnesia.

Our material was obtained from Northern Minnesota through the regular channels, and conformed to the U. S. P. standards. The bark was in pieces 1–5 cm. long, slightly transversely curved, 4–15 mm. wide, and 1 mm. thick. The periderm was young and dark gray in color. Lenticles were few and transverse. The phellogen cells were reddish brown. The inner surface was green, turning to reddish brown in older pieces. The older periderm was flaky with grayish lichen patches common. The fracture was uneven.

In this investigation the dried drug was exhausted with wood alcohol, and the concentrated extract poured into an excess of distilled water. The resin that separated yielded the following substances by fractional extraction. Acetic, valerianic, caproic, caprylic, formic, oleic, linoleic, cerotic and palmitic acids were found in the ligroin extract. From the unsaponifiable material traces of a paraffin (65–70°) and myricyl alcohol that melted at 77°, were obtained.

The ether extract of the resin yielded a quantity of a phytosterolin, $C_{33}H_{56}O_6$, melting at 265–275°, and forming an acetate which melted at 167–168°. A phytosterol agreeing in composition with the formula $C_{27}H_{46}O.H_2O$ and melting at 138° was present. The corresponding acetate melts at 121–123° and has $[\alpha]_D = -37.8°$.

The chloroform and ethyl acetate extracts were uncrystallizable, while the alcoholic extract contained an acidic resin, readily yielding acetic and valerianic acids on saponification.

The drug extractives soluble in the water solution from which the resin had separated, contained acetic and valerianic acids, tannin, sucrose, glucose and an

[1] *Ann. Chim.*, (2) 23, 22, 1817.
[2] *Ann. Chem.*, 55, 330, 1845.
[3] *Arch. Pharm.*, 90, 269, 1844.

ester-like resin yielding acetic and valerianic acids on hydrolysis. The lead subacetate precipitate yielded a crystalline acid, melting at 200–202° ($C_{19}H_{18}O_9$). The biological method of Bourquelot gave indications of the presence of the glucoside in small amount, but it was not isolated.

An alkaloidal assay by the process which is official for Hyoscyamus gave negative results.

EXPERIMENTAL.

A. Proximate Analysis (Mr. Gail Arner).—Quantitative extractions of the air-dried bark with various solvents gave the following results:

Extract.	Percent.
Ligroin (35–55°)	4.0
Ether (110°) (subsequent to above)	1.7
Alcohol absolute	26.87

The proximate analysis resulted as follows:

	Percent.		Percent.
Moisture	8.75	Protein	3.95
Starch (diastase)	7.2, 7.0	Ash	6.95
Pentosans	8.3	Dextrin	0.6
Crude fiber	13.5	Tannin	0.8

Quantitative estimations on the alcohol-soluble carbohydrates were made as follows:

100 Gm. of the finely ground drug were exhausted by repeated extraction with boiling neutral alcohol. The extracts were concentrated to a syrup under diminished pressure and the residue taken up in water. This was precipitated with a slight excess of basic lead acetate solution and the solution made to a volume of 500 cc. An aliquot of this was freed from lead with sodium sulphate and the filtrate was concentrated under reduced pressure to volume of 150 cc (2 cc = 1 Gm. drug).

Of this solution 5 cc (2.5 Gm.) were directly examined by the Walker-Munson process: Cu_2O = 0.0812 Gm. = 0.035 Gm. reducing sugar calculated as glucose. This amounts to 1.4% glucose.

Upon allowing an aliquot to stand over night in the presence of hydrochloric acid a portion equivalent to 1.25 Gm. drug gave 0.1205 Gm. Cu_2O. The percent of sucrose is therefore 2.77.

The polariscopic readings were unsatisfactory, on account of the dark-colored solutions.

Another 50-Gm. sample was first ether-extracted, and then the sugars were extracted with alcohol. The alcohol was removed, and the residue taken up with water and treated with lead subacetate solution in the usual manner; the volume was 250 cc, the direct reading in a 2-dcm. tube was +0.9°. However, upon removing the lead by the addition of a very slight excess of sodium carbonate a solution of the same concentration gave +2.2° at 21° in a 2-dcm. tube.

15 cc (3 Gm.) gave 0.1075 Gm. Cu_2O = 0.0466 Gm. reducing sugar, calculated as glucose = 1.56%.

The lead-free solution was inverted: 100 cc + 5 cc 38% HCl (19 Gm. drug in 100 cc). The reading was +0.2° at 21° in a 2-dcm. tube. At 86° this solution gave an unsatisfactory reading of −0.36°.

10 cc (1.9 Gm. drug) gave 0.1867 Gm. Cu_2O, sucrose = 2.65%.

Calculating the rotations observed to those for a normal solution (26 Gm. in 100 cc) we have, at 21° in a 2-dcm. tube: direct, +2.86°; invert, +0.27°; invert at 86°, −0.5°. By Clerget's formula we calculate, sucrose = 1.95%. The absence of levulose is indicated. Dextrose = 1.2%.

B. Complete Examination of Alcoholic Extract.—For this purpose 34 Kg. were exhausted by percolation with cold wood alcohol. The percolate (410 liters)

was concentrated under diminished pressure to a volume of 8 liters, which was then poured into 72 liters of distilled water. A dark green resin separated. The precipitated resin was removed by filtration and washed with 8 liters of water. The filtrate and washings which were of a dark red color were joined and concentrated under diminished pressure to about 10 liters.

The resin that separated was taken up in alcohol, and the solution concentrated and allowed to stand but there was no evidence of crystallization. The weight of the resin thus precipitated was 1229 Gm., equivalent to 3.6% of the drug. An aliquot (929 Gm.) was poured upon sawdust and dried.

The Examination of the Water-Soluble Constituents.—This extract as stated above was concentrated to a volume of about 10 liters. The distillate was acid. It was rendered alkaline and evaporated on the water-bath to a small volume. It was then again acidified and steam-distilled. The steam distillate was extracted with ether, but most of the acid remained in the aqueous layer. It was neutralized with ammonia and by the addition of successive portions of a 20% silver nitrate solution, several crops of nearly pure silver acetate were separated.

Calculation for $C_2H_3O_2Ag$: Ag = 64.6. Found: 63.8, 64.1, 63.7%.

The ether-soluble volatile acids were joined to the similar fraction obtained when examining the fat.

The concentrated aqueous extract was further reduced in volume and divided into two equal aliquots each of which was exhaustively extracted with ether, which, however, removed only indefinite smeary material. The sodium hydroxide extraction of the ether had a beautiful cherry-red color which turned yellow when acidified. Traces of valerianic acid were present, and sulphur crystals were obtained without difficulty.

One-half of the aqueous extract (17 Kg.) was completely precipitated with an excess of basic lead acetate (1500 cc). The light chocolate-colored precipitate was removed, washed, and decomposed with hydrogen sulphide. The filtrate from the lead sulphide was concentrated to a volume of about 500 cc (255 Gm. solids) and allowed to stand in a desiccator, but nothing crystallized.

The solution contained tannin, as it gave a heavy precipitate with gelatin solution, and a dirty green precipitate with ferric chloride solution. A quantity of the solution equal to 28.9 Gm. plant contained 0.2207 Gm. tannin when examined by the hide powder process (0.8% of drug).

Acid hydrolysis of the material gave a mixture of volatile acids (b. p. 110–225°). The material is not glucosidic. Alkaline hydrolysis with 10% alkali for five minutes gave a trace of volatile acids. The hydrolysis mixture was poured into a slight excess of dilute sulphuric acid, and the mixture was cooled and extracted with large volumes of ether. The ether was washed with water and concentrated to a small volume when a brown powder insoluble in absolute ether separated. In two hydrolyses 0.75 and 0.6 Gm., respectively, were obtained from 64 Gm. of the material. It dissolved in ammonium carbonate solution with effervescence and was reprecipitated upon acidification. After repeated recrystallization from boiling water and decolorization with charcoal it was obtained in magnificent dense rhombic plates. It decomposed with effervescence at 199–202° or higher (206°) depending upon the rate of heating. This material is a complex phenolic acid and is at least dibasic.

0.040 Gm. required 3.9 cc $N/20$ alkali for neutralization using methyl red.
0.0689 Gm. required 7.2 cc; 0.0618 required 6.2 cc $N/20$ alkali.
Calculated for 2 NaOH: mol. wt. = 390. Found: 410, 382 (398).

In order to neutralize the phenolphthalein 5.6 cc $N/20$ alkali were required for the first titration. For analysis the samples were dried at 110°.

Calculation for $C_{19}H_{26}O_9$ (390): C = 58.5; H = 4.6. Found: C = 57.9, 58.2; H = 4.4, 4.4.

The solution of this gave a beautiful green coloration with ferric chloride solution. A bluish black precipitate resulted when sodium bicarbonate was added.

The filtrate from the basic lead acetate precipitate was freed from the excess of lead and concentrated to a syrup that measured 1900 cc. A portion (500 cc) was put aside in a desiccator but nothing crystallized after prolonged standing. It was then exhausted with alcohol, but from neither 95% nor absolute alcohol could any crystallization be brought about. The alcoholic solution was dried upon purified sawdust, and several extractions with ethyl acetate were made. A subsequent extraction with absolute alcohol gave crystals of sucrose (2 Gm.), melting at 182–184° and having $[\alpha]_D = 66.5°$. With phosphotungstic acid a practically negative test was obtained. On standing over night some slight precipitation resulted, but the basic fraction is negligible. The total nitrogen in this fraction is 1.61 Gm. The solution gave negative tests with Mayer's reagent and also with mercuric nitrate.

100 cc syrup gave a phosphotungstic acid precipitation containing 0.004 Gm. N.
100 cc of the syrup (895 Gm. drug) gave 0.085 Gm. N.

The chief constituent here is sugar: 25 cc syrup (223.7 Gm. drug) containing 16.67 Gm. solids of which 0.34 Gm. is ash, were diluted to 100 cc. Direct rotation at 19° in 2-dcm. tube = +7.4°. Of this solution 2.5 cc (0.625 cc syrup) gave 0.1732 Gm. Cu_2O = 0.0765 Gm. glucose.

The solution was inverted, 20 cc + 5 cc 40% HCl being diluted to 100 cc. Reading in 2-dcm. tube is +0.5°, and 10 cc gave 0.3556 Gm. Cu_2O = 4.75 Gm. cane sugar.

By calculation we have in 25 cc syrup 3.15 Gm. glucose and 4.75 Gm. cane sugar; this leaves unaccounted for 8.4 Gm.

A 25-cc portion gave 6.0 Gm. *d*-phenylglucozone. This corresponds to approximately 3.0 Gm. glucose. After recrystallization it melted at 204°. Pentose sugar was present in small amount (0.3 Gm. in 25 cc.).

5 cc syrup gave 0.0543 phloroglucid.

A portion of the syrup was examined by the biological method of Bourquelot for the presence of glucosides.

Examination of Syrup by Bourquelot's Biochemical Method.[1]—The plant contains only sucrose (1.9%) as the hydrolysis with the invertase showed no interfering sugars. The invert sugar amounts to 1.5% and a substance is present which is very slowly hydrolyzed by emulsin, at least 0.228 Gm. glucose being liberated per 100 Gm. viburnum while the rotation changes from −6.46° to −3.4° V. or +3.06° V. Duplicate gave +2.51° V. This would appear to indicate the presence of about 0.5% of a β-glucoside.

All the following work was accompanied by proper controls.

(*a*) *Direct.*—28 cc syrup (= 250 Gm. viburnum) + 6.25 cc 0.5 *N* sodium phosphate solution + 12 cc 0.5 *N* hydrochloric acid + thymol water q. s. to 250 cc (solution is .001 *N* acid). Rotation in 2-dcm. tube at 22° = +3.39° V. Walker-Munson process: 5 cc = 0.1620 Gm. Cu_2O = 0.0739 Gm. invert sugar = 1.48% of the drug.

[1] *Archiv. d. Pharm.*, 245, 172, 1907; "Handbuch d. Biochem. Arbeit," VII, 766.

(*b*) *Action of Invertase.*—200 cc of above solution + 0.25 Gm. active invertase. After standing several days readings were obtained at 24-hour intervals in 2-dcm. tube at 22.5° equal to −6.46° V. 5 cc gave 0.3821 Gm. Cu_2O. Sucrose: by reduction = 1.93%; by Clerget's formula = 1.93%.

(*c*) *Action of Emulsin.*—100 cc of above solution were plunged into a boiling water-bath for 10–15 minutes to inactivate the invertase. The solution was cooled to room temperature and 0.5 Gm. active emulsin added. After 3 days the rotation was −4.09° V. and 5 cc gave 0.3863 Gm. Cu_2O. Another 0.1 Gm. of emulsin was added and on the fifth day the rotation was −4.08° V. and 5 cc gave 0.3884 Gm. Cu_2O. Emulsin set free 0.055 Gm. glucose for 100 Gm. viburnum.

These solutions were permitted to stand. On the 9th day the rotation was −3.93° V. Reduction: 5 cc = 0.3971 Gm. Cu_2O. On the 16th day the rotation was −3.41° and on the 21st day duplicate reductions gave 5 cc = 0.4069, and 0.4052 Gm. Cu_2O. Emulsin therefore set free 0.20 Gm. per 100 Gm. viburnum.

In another experiment the rotation was more rapidly changed to the right by emulsin. The amount of glucose set free by emulsin was 0.228 Gm. per 100 Gm. viburnum.

Direct Reading = 3.31° V.; *invert reading* = −5.55° V.; *emulsin reading* = −3.04° V. (2 days). The reductions were 0.1675 Gm. Cu_2O; 0.3641 Gm. Cu_2O; and 0.3913 Gm. Cu_2O, respectively.

Acid Inversion.—As the hydrolysis by emulsin did not appear complete even after long standing an acid hydrolysis was made and a very considerably increased yield of reducing substance was obtained, likewise the rotation change was much more positive.

28 cc syrup + 6.25 cc 0.5 *N* sodium phosphate solution + 12 cc 0.5 *N* hydrochloric acid + thymol water 190 cc + 15 cc concentrated hydrochloric acid; stood over night; made up to 250 cc as before. The rotation was constant for days at + 1.3° V. Reduction: 5 cc = 0.4293 Gm. Cu_2O. This value was constant.

Part of the syrup (500 cc) was fermented with yeast. The solution was clarified with lead subacetate and the excess of lead removed with hydrogen sulphide. The sugar-free resinous residue was not crystalline.

A quantity (86 Gm.) was slightly acidified, and steam-distilled. The distillate required 38 cc *N* alkali. The acids were valerianic and acetic. (Ag = 49.0, 50.0, 56.6, 64.0, 63.6.) The solution was then concentrated to 100 cc and hydrolyzed in the presence of 10% sodium hydroxide. It was acidified and again distilled. The distillate required 23.9 cc *N* alkali. (Ag = 49.25, 50.0, 63.0, 64.1.) The volatile acids amount to about 4 or 5% of the ester-like resin which is very similar to the resin in *Viburnum prunifolium.*

Examination of the Resin.—The resin (929 Gm.) after thorough drying upon purified sawdust was transferred to a continuous extractor and extracted with the following results:

Petroleum ether (40–60°)	365 Gm.
Ether	160 Gm.
Chloroform	23 Gm.
Ethyl acetate	95 Gm.
Alcohol	128 Gm.
Total	771 Gm.

It is observed that 158 Gm. (16% of the resin) was not recovered, alteration having rendered some of it insoluble in alcohol.

The Ligroin Extract.—This was concentrated to a syrup and redissolved in ether. The solution was extracted with 10% sodium hydroxide solution. The alkaline solution was acidified and again extracted with ether and then this was fractionally extracted with solutions of ammonium carbonate, potassium carbonate, and potassium hydroxide. The potassium carbonate extract was acidified and steam-distilled. The volatile acids in the distillate were joined with those obtained

upon hydrolysis of the fat. The non-volatile fatty acids were shaken out with ether, dried over sodium sulphate and distilled. They boiled chiefly at 253–260° at 35–45 mm. The weight of distilled acids was 30 Gm. (Iodine No. = 88.2). Neither potassium hydroxide extract nor the ammonium carbonate extract previously mentioned removed anything of interest.

The original ether extract of the neutral solution of fat was evaporated to dryness and saponified with alcoholic potash for five hours. The alcohol was removed and water added to completely precipitate the unsaponifiable matter which was shaken out with ether.

Examination of Unsaponifiable Matter.—The dried solution contained about 99 Gm. of a deep orange-colored syrup which when dissolved in alcohol and gradually concentrated yielded only traces (0.03 Gm.) of a paraffin-like solid that melted indefinitely at 65–70°. The alcohol was removed and the material was distilled under diminished pressure.

Fraction I (b. p. 80–200° at 25 mm.). Reddish oil, 4 Gm.
Fraction II (b. p. 200–225° at 15 mm.). Light brown oil, 10 Gm.
Fraction III (b. p. 225–270° at 15 mm.). Thick viscous liquid, 13 Gm.
Fraction IV (b. p. 270–305° at 15 mm.). 10 Gm.
Fraction V (b. p. 305–320° at 15 mm.). 10 Gm.

The residue weighed 43 Gm. There separated from III some material melting at 58–61°. Several crystallizations raised this to 75°. The same material was obtained from IV. It crystallized from ethyl acetate in needles. The melting point was 77° but lack of material prevented further purification.

Calculation for $C_{30}H_{62}O$: C, 82.2; H 14.1. Found: C, 83.1; H, 13.7.

The material is therefore myricyl alcohol.

Examination of the Volatile Fatty Acids.—The alkaline solution from which the unsaponifiable matter had been extracted with ether was acidified and steam-distilled. The distillate was extracted with ether. By titration the aqueous layer showed the presence of 4.4 Gm. acetic acid which was isolated as the silver salt, and some reduction indicated the probable presence of formic acid.

Calculation for $C_2H_3O_2Ag$: Ag = 64.6. Found: 62.9, 65.0%.

The ether-soluble volatile acids (10 Gm.) with which a small quantity of sulphur was admixed were dried and fractionally distilled: (1) up to 129°; (2) 175–186°; (3) 186–205°; (4) 205–240°; (5) 240–270°. The first fraction was converted into silver salts and the presence of formic and acetic acids was indicated. The remaining fractions were redistilled and a small amount (0.2 Gm.) of the second fraction distilled below 175°. To this residue the third fraction was added and a fraction was collected (2.5 Gm.) at 175–190° with reference to the boiling point of valerianic acid which is 186°.

Calculation for $C_5H_{10}O_2$: C = 58.8; H = 9.8. Found: C = 58.4; H = 9.8.

To the residue not distilling at 190° the higher boiling fraction was added and fractions were prepared as follows: (*a*) −196° (0.2 Gm.); (*b*) 196–212° (0.7 Gm.); and (*c*) 212–225° (0.4 Gm.).

The fraction boiling at 196–212° was collected with reference to the boiling point of caproic acid (204–205°) but the fraction contains also caprylic acid.

Calculation for $C_6H_{12}O_2$: C = 62.1; H = 10.3; for $C_8H_{16}O_2$: C = 66.7, H = 11.1. Found: C = 64.5; H = 10.4.

The highest boiling fraction (212–225°) is chiefly caprylic acid, containing a small quantity of unsaturated acid, which reduced alkaline permanganate solution. The silver salt was fractionally crystallized and analyzed.

Calculation for $C_8H_{15}O_2Ag$: Ag = 43.0. Found: Ag = 42.2, 42.0.

The volatile acids therefore consist essentially of acetic and valerianic acids. A trace of formic acid is present and the presence of caproic and caprylic acids is proved.

Examination of the Non-Volatile Fatty Acids.—The acid mixture which had been steam-distilled was cooled and extracted with ether. From the dried solution the ether was removed and the residue of non-volatile fatty acids distilled under diminished pressure. They were collected in two fractions: (1) 235–250° at 25–35 mm., (2) 260–280° at 25 mm. The former which amounted to 80% of the material had an iodine number of 82.5, the latter 101.3.

The solidified non-volatile acids derived from the potassium carbonate extract were separated through the lead salts into the solid and liquid acids, whereupon 21.3 Gm. yielded 7.3 Gm. solid acids and 13.2 Gm. liquid acids (62%). The solid acids still had an iodine number of 24. The liquid acids boiled chiefly but not completely at 226–270° at 17 mm. and this fraction had an iodine number of 119.3. The entire liquid acids were now esterified and a fractional distillation of the methyl esters showed that 90% of these distilled between 200–215° at 15 mm. This is therefore a mixture of the methyl esters of linoleic acid (208° at 11 mm.) and oleic acid (213° at 15 mm.). The iodine number was 122.35.

Calculation for $C_{19}H_{36}O_2$: I. V. = 85.8; $C_{19}H_{34}O_2$: I. V. = 172.7. Found: I. V. = 122.35.

A part of the non-volatile acids obtained upon hydrolysis of the glycerides were likewise separated by means of the lead salts in order to prepare a larger quantity of the acids. The liquid acids boiled smoothly at 215–245° at 15 mm., mostly at 232–236°.

Calculation for $C_{18}H_{34}O_2$: C = 76.6; H = 12.1; I. V. = 90.1; for $C_{18}H_{32}O_2$: C = 77.1; H = 11.4; I. V. = 181.4. Found: C = 76.95; H = 11.6; I. V. = 128.

This agrees with the values required for a mixture of oleic acid (58%) and linoleic acid (42%).

The solid saturated acids were crystallized from absolute alcohol. There was isolated in the first fraction, cerotic acid melting at 76°.

Calculation for $C_{26}H_{52}O_2$: C = 78.8; H = 13.1; N. V. = 141.7. Found: C = 78.3; H = 13.35; N. V. = 144.9.

The filtrate yielded a mixture of acids, consisting chiefly of palmitic melting at about 51–53°.

Calculation for $C_{14}H_{28}O_2$: C = 73.7; H = 12.3; for $C_{16}H_{32}O_2$: C = 75.0; H = 12.5; for $C_{18}H_{36}O_2$: C = 76.1; H = 12.7. Found: C = 74.65; H = 12.2.

The Ether Extract of the Resin separated a quantity (38 Gm.) of insoluble material. Recrystallized from dilute pyridine a white microcrystalline product consisting of a phytosterolin was obtained. It melted at 265–275° and was identified as the acetate which melted at 167–8° sharply, and had the characteristic crystalline appearance of this compound

Calculation for $C_{33}H_{52}O_6$ $(COCH_3)_4$: C = 68.7; H = 8.9. Found: C = 68.6; H = 8.8.

The ethereal filtrate when extracted with the usual alkaline solvents yielded nothing of interest, most of the fraction separating as a green chlorophylaceous mass insoluble in the ether and in the solvent. Repeated filtration removed this and the ethereal solution after being extracted was concentrated and a quantity of a neutral substance separated from the ether. This was crystallized from alcohol four times, finally melting at 138° sharply. It crystallized in nacreous plates, and gave the color reactions characteristic for the phytosterols although the appearance of the final permanent green was long delayed by the intermediate blue coloration.

The material was converted into the corresponding acetyl derivative, and after crystallization from acetic anhydride it was fractionally crystallized from ethyl acetate. The acetate melts at 121–123°. The phytosterol was regenerated from this and melted at 137.5–138° after recrystallization from alcohol.

Calculation for $C_{27}H_{46}O.H_2O$: H_2O, 4.8. Found: 4.8, 4.8.
Calculation for $C_{27}H_{46}O$: C, 83.9; H, 11.9. Found: C, 83.95, 83.35; H, 11.8, 12.2.

0.3351 Gm. acetate made up to 20 cc with chloroform showed a rotation of −1.266° in a 2-dcm. tube, whence $[\alpha]_D^{23} = -37.8°$.

The ethereal filtrate diluted with 95% alcohol gave green-colored mixtures consisting in part of this phytosterol. This was not further studied.

The Chloroform Extract.—This was a dark green resin (23 Gm.) and yielded nothing of interest. It was not glucosidic.

The Ethyl Acetate Extract (95 Gm.) was concentrated to dryness and redissolved in alcohol, but no crystallization could be effected after prolonged standing. It yielded nothing crystalline. When boiled with dilute, hydrochloric acid, it turned raspberry-red in color but no evidence of a glucoside was obtained.

The Alcoholic Extract of the Resin (128 Gm.) yielded nothing crystalline. It was not glucosidic.

5 cc of the alcohol solution (0.4 Gm.) were precipitated with 45 cc water and the alcohol removed on the steam-bath. The precipitation resin was centrifuged off and repeatedly washed with water. The resin was dissolved in 10 cc 10% alcoholic hydrochloric and boiled for 1 hour. The alcohol was distilled off, and the residues taken up with water. The solutions and rinsings were made up to 100 cc. Fifty cc gave 0.0117 Gm. Cu_2O = 0.0051 Gm. glucose = 2.6% of the resin.

The entire extract was treated with 200 cc alcoholic potash (10%) and proved to be almost completely precipitated. The addition of water rendered it more soluble. After the addition of enough alkali to make 10% of the volume, the mixture was boiled for about five hours on reflux. The alcohol was distilled off, and the liquid acidified and steam-distilled. The distillate (= 85 cc *N* alkali) contained a quantity of volatile acids, which were converted into the silver salts and analyzed (acetic and valerianic acid).

Found: Ag = 48.3, 49.2, 63.8, 64.0%.

The material from which these acids had been steam-distilled was extracted with ether, but nothing was isolated.

The writer is indebted to Mr. Clayre Pomeroy and Mr. J. F. Staley for assistance in this analysis.

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PHYTOCHEMICAL NOTES.*

No. 89. Oil of *Bystropogon canus*.

BY JULIA WHELAN.†

Writing from LaPaz, Bolivia, under date of June 29, 1921, Professor Rusby, Director of the Mulford Biological Exploration, sent the following communication:

"Ever since my residence here in 1885, I have had it in mind to sometime secure material of one or both species of *Bystropogon* that grows abundantly on the ledges of the basin in which LaPaz is situated, so that the volatile contents might be distilled and studied. This was one of the first objects of my present expedition and I have been greatly disappointed to find at this mid-winter season the hills are bare of both species. However, a small amount of one of the species has been obtained in a ravine below the city. This has been dried and packed into a gunny-sack and will be shipped to the Mulford Company in a few days, with instructions to forward to you. I had intended to send you two hundred (200) pounds, but I doubt if the amount that I have obtained will equal twenty-five (25) pounds. I hope that you will be able to do something with it.

"I think the species is *B. canus*, but it may possibly be the other, the name of which I do not recall at the moment.

"When fresh this shrub has a strong odor of pennyroyal, but after being dried this odor has become decidedly modified. It is possible that I may obtain more of it farther down but I think it unlikely."

Gildemeister[1] in 1916 records the oils from two species of *Bystropogon*, the one obtained from *B. origanifolius* L'Hérit in the Canary Islands, the other from *B. mollis* Kth. an "Argentine mint." But little is known about either oil, hence the statements may as well be quoted in full.

"814. Oel von *Bystropogon origanifolius*. Das Oel des auf den Kanarischen Inseln haeufig vorkommenden Strauchs *Bystropogon origanifolius* L'Hérit[2] ist von hellgelber Farbe und ist im Geruch dem Poleioel aehnlich. $d_{15}°$ 0,9248; α_D + 2°57′; $n_{D20°}$ 1,48229; S. Z. 0; E. Z. 11,1; E. Z. nach Actlg. 53, 83; loeslich in 2,5 Vol. 70% igen und 0.7 Vol. 80% igen Alkohols. Bei der Destillation geht es zwischen 162 und 234° ueber.

"Das Oel enthaelt wenig 1-Limonen (Tetrabromid, Smp. 104°), in der Hauptsache Pulegon (Oxim, Smp. 157°) und etwas Menthon (Semicarbazon, Smp. 180 bis 181°)."

"815. Oel von *Bystropogon mollis*. Die argentinische Minze, *Bystropogon mollis* Kth., gibt nach A. Doering[3] 0,4% aetherisches Oel. d 0,918 bis 0,920; es siedet hauptsaechlich bei 210° und enthaelt ungefaehr 0.7% freie Saeuren, Spuren Phenol und 2,5% Fururol. Menthol scheint nicht vorhanden zu sein."

The herb arrived in Madison late in October 1921 but was in good condition in spite of its prolonged voyage. The 28 lbs. of material were distilled under the direction of Professor Richtmann. The first oil which separated from the aqueous distillate weighed 25.5 Gm. (= 0.2 p. c.). The aqueous distillate upon three cohobations yielded an additional 13.7 Gm. (= 0.1 p. c.) of oil. The last cohobate, when fractionated for water-soluble constituents, yielded only a few drops of oil.

Both the original and the cohobated oils were greenish in color not unlike bergamot oil. The odor of the original oil reminded more of fatty acid esters than menthol; to that of the cohobated oil there may have been a suspicion of mint

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* From the laboratory of Edward Kremers.

† Fritzsche Bros. Fellow 1920–21.

[1] "Die aetherischen Oele," Vol. 3, p. 534.

[2] "Bericht von Schimmel & Co.," October 1902, p. 87.

[3] *Bol. Acad. Nac. Ciencas* Cordoba, 19, 379, 1913; *Jour. Chem. Soc.*, 106, 1172, 1914.

Later both of these odors seemed to disappear and a pulegone-like odor seemed dominant.

The small amount of oil precluded a chemical investigation. However, a few constants were determined. For the sake of comparison, these are herewith tabulated together with those of *Bystropogon origanifolius* and *B. mollis*.

	B. canus? Original oil.	*B. canus?* Cohobated oil.	*B. origanifolius.*	*B. mollis.*
d	0.910 at 20°	0.980 at 20°	0.9248 at 15°	0.918 to 0.920
α_D	−0.59°		+2°57′	
n_D	1.563 at 25°	1.4623 at 25°	1.48229 at 20°	
A. V.	0	0	0	(abt. 0.7 p. c. free acids)
S. V.	183	135	11.1	

The amount of oil remaining was just sufficient to acquire some crude notion as to its boiling temperature, hence it was fractionated. Not more than two or three drops came over below 200°, hence terpenes were conspicuous by their absence. (Contrast the limonene content of *B. mollis*.) Three fractions of a few cc each were collected which, however, sufficed to determine their density. The last fraction had a delicate blue color, whereas the original oil had been somewhat olive-green. The residue was dark in color and its odor was indicative of decomposition. The boiling temperatures, etc., of the fractions are, herewith, tabulated:

Fraction.	B. temp.	Amt.	$d_{20°}$.
1	200 to 225°	2 ccm	0.9274
2	225 to 235°	2.5 ccm	0.9536
3	235 to 240°	5 ccm	0.9610

Menthol boils at 212° and has a density of 0.890 at 20°; pulegone boils at 222° and has a density of 0.9393 at 23°. However, neither the bisulphide test nor the nitroso test for pulegone gave positive results. Neither did exposure at low temperature cause any menthol to crystallize out. Likewise, Flueckiger's test for thymol and carvacrol gave negative results. It is apparant that larger amounts of material will be necessary to obtain more satisfactory information about the composition of this oil obtained from one of a seemingly interesting group of plants.

TEMPERATURE REGULATOR.*

For Automatically Controlling the Temperature of Water-Baths.

BY PAUL S. PITTENGER.

In two previous articles I described apparatus for maintaining temperatures above[1] and below[2] that of the ordinary room.

In the two forms described, the temperature was controlled by means of a toluol-mercury electric regulator operated by dry cells, the regulator serving to make and break the battery current to a relay which in turn either opened or closed the

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* Read before Scientific Section, A. Ph. A., New Orleans meeting, 1921.

[1] "An Improved Apparatus for Testing the Activity of Drugs on the Isolated Uterus," JOUR. A. PH. A., 7, 512, 1918.

[2] "A Constant Temperature Bath for Maintaining Temperatures Lower than That of the Room," *Ibid.*, 5, 1261, 1916.

110- or 220-volt circuit to an electric heater or a solenoid valve in an ice-water supply pipe.

The devices described were entirely satisfactory but required the periodic renewing of the dry cells. In an endeavor to eliminate this, experiments were made by replacing the toluol-mercury regulator, dry cells and relay, with a bi-metallic electric thermoregulator. This worked fairly well with comparatively high temperatures but was not sensitive enough for temperatures lower than 40° C.

As we employ this form of apparatus principally for controlling constant temperature baths for biologic assay work it was necessary that the regulator be sensitive to a variation of 1 to 2° C. for temperatures between 22° C. (for frogs and gold fish) and C. 38° (for isolated uterus experiments).

It was therefore necessary to return to the toluol-mercury regulator. By carefully adjusting the size of the toluol bulb and the diameter of the mercury column, this regulator can be made sensitive to variations in temperature of less than 1° C.

We have finally overcome the annoyance of renewing the dry cells by replacing them with an electric "Toy Transformer" such as used for running toy electric trains under Christmas trees. These transformers can be purchased at almost any electric supply house and are so constructed that when attached to a 110-volt circuit, a range of from 1 to $27^1/_2$ volts may be obtained.

Briefly summed up, the new temperature regulating outfit is arranged as follows:

A toluol-mercury regulator is placed so the bulb dips into the water-bath. The toy transformer is then adjusted to 10 volts, connected with the regulator and a relay in such a way that the 110- or 220-volt current through the relay will heat an electric immersion heater or operate a solenoid water valve by which a cold water supply from a cooler may be either released or withheld.

When an experiment is to be conducted the toluol-mercury regulator is adjusted to the temperature which we desire to maintain as described under Fig. 1, and as soon as the temperature of the water in the water-bath rises to this point, the toluol expands sufficiently to make an electrical contact which throws the relay, which in turn breaks the current to the electric heater or opens the solenoid valve which releases ice water from the cooler.

As the contents of the water-bath become cooler, the toluol in the regulator contracts and the 10-volt circuit through the relay is broken, thereby automatically turning on the current to the heater, or shutting off the supply of ice water until the temperature once more rises above that which we desire to maintain.

The following illustrations and explanations cover the arrangement of the new apparatus in detail.

Fig. 1 shows the construction of the *toluol-mercury regulator*. That portion of the glass tube which is lightly shaded (*1*) represents toluol. The black portion (*2*) represents mercury. The point of wire (*4*) is so arranged that it may be raised or lowered through stopper (*5*). Wire (*3*) is constantly in contact with mercury (*2*).

In order to adjust the regulator so that it will throw the relay at a given temperature, it is only necessary to place bulb *1* in a large beaker of water, or the water-bath, bring the temperature of the water to the exact temperature desired and then adjust battery wire *4* so that it just touches the surface of the mercury.

The regulator will then make a contact whenever the temperature of the bath rises to this point, and thus throw the relay.

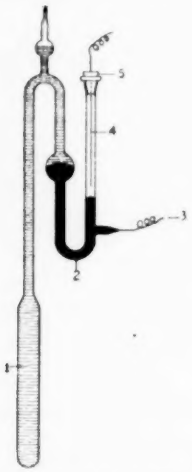

Fig. 1.—Toluol Mercury Regulator.

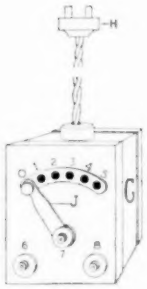

Fig. 2.—Toy Transformer.

Fig. 2 shows the *toy transformer* in which *H* represents an electric plug for attaching to 110- or 220-volt current; *J*, the lever switch; *1*, *2*, *3*, *4* and *5* are the "points" of the rheostat controlling the voltage: *6*, *7* and *8* are connecting posts.

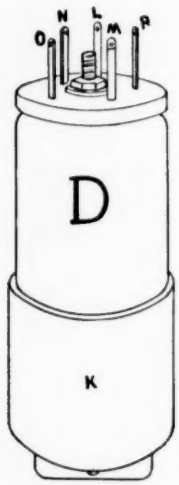

Fig. 3.—Relay.

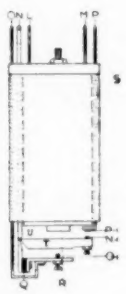

Fig. 4.—Relay with Cap *K* Removed.

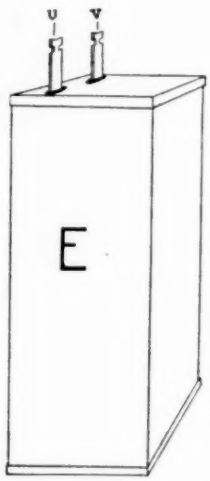

Fig. 5.—Condenser.

The following table shows the voltage obtained by the use of the switch and various connecting parts on the transformer illustrated:

Lever positions.....	0	1	2	3	4	5
Between 6 and 7.....	0	2½	5	7½	10	12½
Between 7 and 8.....	0	25	22½	20	17½	15
Between 6 and 8.....			27½ volts			

Figs. 3 and 4 illustrate the construction of the *relay*. *L* and *M* are the connecting posts attached to the terminals of the wire of coil *S* which surrounds the core *R*; *N*, *O* and *P* are the connecting posts for the wires carrying the 110- or 220-volt current and are connected directly with contact points *N-1*, *O-1* and *P-1*; *T* is an armature with a hinged joint at *U*; *Q*, insulating material.

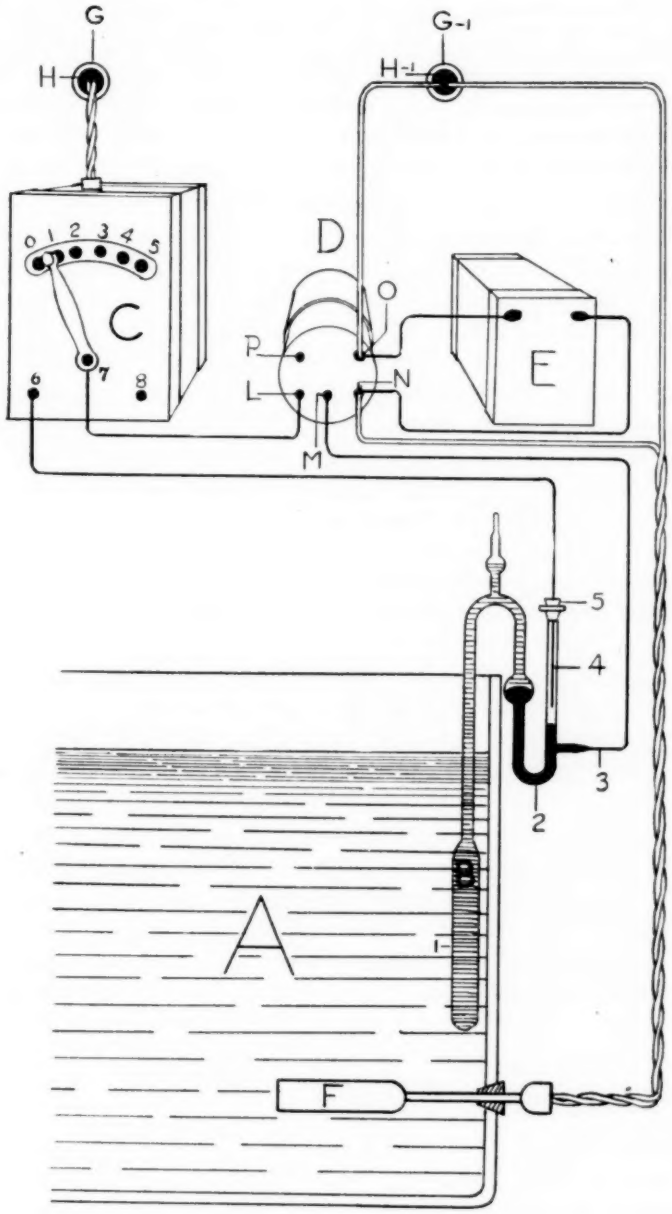

Fig. 6.—Method of Connecting Entire Apparatus.

When a current of about 10 volts is passed through coil *S* it makes an electromagnet of core *R*, thus raising the armature *T* and either breaking the contact between *O-1* and *T*, or making the contact between *N-1* and *P-1*. Thus the relay can be made to either make or break the 110- or 220-volt circuit depending upon which connecting posts are attached to the wires. If posts *O* and *N* are used, the relay will break the circuit by breaking contact *O-1* to *T*. If the posts *N* and *P* are used, the relay will complete the circuit by making contact *N-1* to *P-1*.

Fig. 5 shows the condenser. The two posts *U* and *V* are attached to wires connecting them with the same two posts of the relay to which the wires of the 110- or 220-volt circuit are attached. The purpose of the condenser is to reduce the "spark" in the relay and thus prevent the contacts *N-1*, *O-1* and *P-1* from burning off.

Fig. 6 shows the method of connecting entire apparatus. *A* represents the water-bath; *B*, toluol-mercury regulator; *C*, transformer; *D*, relay; *E*, condenser; *F*, electric immersion heater; *G* and *G-1*, electric sockets, 110- or 220-volt; *H* and *H-1*, electric plugs.

For maintaining temperature above that of the room, one wire from the electric heater *F* is attached directly to plug *H-1*, the other wire is attached to post *N* of the relay, and another wire connects post *O* with the plug *H-1*. By this arrangement, the current from the plug *H-1* passes uninterrupted through the relay contacts *O-1* to *I* to the heater *F*. The wire *4* of the regulator is attached to one "connecting post," *6*, of the transformer. The end of wire *3* is constantly in contact with the mercury, and the other end is connected to one "battery pole," *M*, of the relay. The other "battery pole" *L* of the relay is connected with the "connecting post" *7* of the transformer. As the temperature of the tank increases, the toluol in the regulator expands, causing the mercury to rise until it touches the end of wire *4*, thus completing the 10-volt circuit from the transformer and allowing the current to pass through the coil *S* around the core *R* of the relay. This forms an electromagnet which raises the armature *T*, thus breaking the contact *O-1* to *T* in the 110- or 220-volt circuit, and stopping the flow of electricity to heater *F*.

With the gradual lowering temperature of the water-bath, the toluol contracts and causes the mercury to fall away from wire *4* thus breaking the current which is passing through the coil of the relay. This break allows the armature to fall and again make contact *O–1* to *T*, and the current again passes from plug *H-1* to the electric heater.

If it is desired *to maintain a temperature lower than that of the room*, the 110- or 220-volt wires from the relay are connected with a solenoid valve in an ice-water supply pipe instead of the immersion heater and connecting posts *N* and *P* of the relay are used.

The entire apparatus only occupies about 4″ × 8″, and is especially useful for digestive ferment and biologic assays, or any experiment where a sensitive regulator is required.

PHARMACODYNAMIC LABORATORY,
H. K. MULFORD COMPANY.

AN UNUSUAL ALKALOIDAL PRECIPITANT.*

BY WILLIAM G. TOPLIS.

Potassium citrate is a remedy of frequent use in prescription work. In the course of years of observation some curious phenomena were noted in connection with potassium citrate that encouraged a closer scrutiny of its behavior.

If, for example, Camphorated Tincture of Opium is saturated with potassium citrate, several changes occur.

First, the alcoholic and watery portions separate into two layers, the lower being a saturated solution of potassium citrate and the water-soluble components of paregoric, the upper layer containing the alcohol and the parts soluble in it. Between the two layers appears, on standing, a precipitate which contains among other things the alkaloids formerly present in the sample. Similar changes occur under like conditions with Tincture of Nux Vomica, Tincture of Cinchona, Tincture of Belladonna, and others.

Precipitates obtained in this manner suggested the possibility of the presence of alkaloids, though they were always colored by matter from the original drug. In order to discover the truth concerning this surmise, a concentrated alcoholic extract of *Cinchona Calisaya* was saturated with potassium citrate. The resulting precipitate was collected upon a filter, thoroughly washed with distilled water, drained, and then treated with dilute hydrochloric acid. The acid filtrate was permitted to evaporate spontaneously, with no attempt at further purification. The result was a crop of colored crystals of the hydrochlorides of the mixed alkaloids of cinchona.

To prove this statement, further work with crude drugs was abandoned, and the next step was a study of the behavior of potassium citrate with known alkaloids taken from stock. Accordingly, it was found that quinine bisulphate, in distilled water, is promptly and completely precipitated by potassium citrate. The nature of this precipitate was not known positively until, after thorough washing with distilled water to remove sulphates, a final test disclosed the precipitate to be quinine citrate. This test was carried out by the use of an immiscible solvent (ether, alcohol, ammonia) upon the wet precipitate on the filter. The ethereal portion contained the quinine in solution, as a supernatant layer of the filtrate, while the watery portion held the citric acid as ammonium citrate. It was from this portion that a satisfactory test for citric acid was obtained.

Citrate of quinine is only sparingly soluble in water; a portion after repeated washing showed little loss of weight. Its solubility is probably not greater than that of quinine alkaloid, which is reported to be 1 in 1,500 parts of water. Citrate of quinine is even less bitter to taste than quinine alkaloid. It seems that the quinine citrate may be precipitated quantitatively by an excess of the reagent and, perhaps, serve as an easy assay method.

Quinine citrate is readily soluble in dilute hydrochloric acid, and, therefore, doubtless capable of its physiological action in the system, after conversion in the stomach. Sodium citrate behaves in the same manner, so far as precipitating alkaloid is concerned, but it does not separate the alcohol from the water in tinctures as does potassium citrate. We have found that the alkaloids of opium, nux vomica,

* Read before Pennsylvania State Pharmaceutical Association, 1921.

cinchona, belladonna and, doubtless, others respond to this reagent, in fact so far as we have gone there has been not one exception. All have been precipitated, though not with the same facility, some responding more promptly in dilute solution than others. In this respect quinine seems to be more responsive than all of those examined thus far, probably because of its low solubility.

It was found by experiment that a 5% quinine solution was precipitated with a like amount of potassium citrate. In one instance, in a still more dilute solution, after standing, the quinine appeared in long, colorless needles. Strychnine sulphate, 1% solution, precipitated slowly in the presence of 5% potassium citrate as small, brilliant crystals adhering to the sides of the tube; in a 10% potassium citrate solution the precipitation was rapid and complete. Morphine, 5% solution, was promptly precipitated by 5 percent of potassium citrate. Codeine, heroine, atropine, were all precipitated, and in most instances did not redissolve upon further dilution with water. Caffeine precipitated in concentrated solution but redissolved on further dilution.

These facts suggest the advisability of "shake well" labels on prescriptions containing such ingredients.

The foregoing is all we have to offer so far as demonstrable truth is concerned. In addition, however, we invite you to go with us on a short excursion through a fanciful speculation. Alkaloids are nitrogenous bodies that form addition compounds like ammonia; amines behave similarly; ptomaines derived from putrefactive changes in intestinal contents; toxins derived from the development of bacteria in favorable culture media, and venom from poisonous reptiles are, if we are correctly informed, similar in composition to alkaloids.

Potassium citrate is described in the U. S. Dispensatory as being diaphoretic and refrigerant. There is no statement as to how its functions are performed and it is doubtful whether this information is known.

The question that naturally arises in light of the above statements is, does potassium citrate, when absorbed into the circulation, encounter therein toxic substances, and does it unite with them to form insoluble compounds, as in the test tubes? And further, if this surmise should prove to be true, would it follow that former poisons would become inert? And if this should prove to be true, would it not follow that the logical manner for introducing the remedy into the system would be by way of intravenous injection? And in light of the fact that sodium compounds are best tolerated by the system, would not a sterilized solution of sodium citrate be the proper mode of administration?

We have very little experimental evidence to offer in support of this theorizing. Just one little fact is worthy of mention: Hexamethylenamine gives a very finely divided precipitate in presence of potassium citrate.

ABSTRACT OF DISCUSSION.

In answer to a question by Dr. C. B. Lowe as to how long it required for precipitation to occur, the author answered—"immediately."

Charles H. LaWall said, "It is certainly interesting that a hitherto unrecorded fact should now be presented relative to a frequently used remedial agent, that is an alkaloidal precipitant. It really comes with added force that the 'Shake well' label should be more frequently used."

THE COATING OF COMPRESSED TABLETS.*

BY ROBERT C. WHITE.

The thought has come to the writer in the preparation of a paper on "The Coating of Compressed Tablets" that a very much larger paper could have been presented on how tablets should not be coated rather than on how they should be. On the market to-day we find a great many varieties of coating with regard to the colors presented, the materials used, the quality of these materials and the quality of the coating itself, all of which is indicative of the knowledge and skill of the manufacturer and his conception of what a fine coated tablet should be. A few general remarks at this time may be enlightening.

Coating work originally began with pills, and just as tablet manufacture itself sprang from the manufacture of pills so was the idea of coating tablets adopted. The first pills coated were unquestionably handled singly and the methods were very crude. Pills were picked up one at a time, either on the point of a needle or with a pair of tweezers, and dipped in a heavy solution of gelatin, or acacia, or a combination of both. Later experiments were made combining with these two agents syrups in varying amounts. The gelatin coating of pills developed rapidly to a place where as many as five hundred were picked up at a time, held in place on the end of small tubes by suction, one-half of the pills then being dipped in the gelatin solution, the process reversed and the other half dipped. All this work involved the selection of certain grades of gelatin, and the manufacture of certain densities of this solution, the heating problems being more or less complex, not only at the time of dipping but also in the subsequent drying of the pills which had been coated. The use of various colors in pill coating was tried out from time to time but at present the colors are practically limited to black, white and brown.

Pills, as we know, are manufactured from the plastic mass and contain more or less moisture, whereas tablets are manufactured from dry ingredients and do not or should not contain moisture. Sugar coating for that reason is not only best in handling tablets, but is preferable on account of a great freedom from temperature and humidity interference. The dipping of pills or tablets into a syrup solution would not give a smooth coating as the sugar would ultimately crystallize on the tablet. Coating basins were, therefore, necessary for this work. These should be spherical in shape, as any corners or edges would not allow the tablet to roll properly and would interfere with the entire method. These are, as all of us know, made of copper, the basin being surrounded by steam coils, and also being equipped with a hot and cold air blast. These basins are geared to a shaft in such a manner that they rotate in one regular direction. The speed of this rotation varies in accordance with the size of the basin, and the size and kind of coating work which is to be done. While the work done is regarded by many as sugar coating pure and simple, this idea is erroneous, as with the vast majority of tablets coated use is made of both acacia and gelatin. The building up of the first layers of coating is referred to as sub-coating, thus giving us three stages before finishing, namely, sub-coating, coating, and polishing. The sub-coating, of course, varies in accordance with the ingredients in the tablets. It will readily be seen that the coating of a tablet made almost entirely of heavy extracts would differ from one containing volatile ingre-

* Read before Philadelphia Branch A. Ph. A., March meeting, 1922.

dients such as chloral, camphor, caffeine, etc. The coating will also vary if the tablet be white originally, or if it be one of dark color.

The results desired in ninety-five percent of all coatings are confined to three purposes; first, and most practical, the protection of the ingredients in the tablet itself; second, the rendering of unpleasant-tasting ingredients tasteless; and third, the appearance. The last gives rise to the wide variety of colors and shades which are to be found in tablets to-day. These are without end, and must suit the whim of an enormous number of individuals who are anxious that their tablet differ from all others. There can, therefore, be no standard of color to which the manufacturer can adhere, especially when it comes to private formulas. Different size basins are used, from those eight inches in diameter up to sixty inches; this of course, to accommodate the large and small runs of tablets. As in other forms of pharmaceutical processes, it is vastly cheaper per thousand to coat half a million tablets in one operation than to coat twenty-five or fifty thousand. It will be found that aside from the small cost of additional coating material, the labor and time involved are the same.

The coating of tablets with the use of talcum was at one time popular. This was called "pearl coating" and followed the period when gilding and silvering of tablets was popular. It is a fact that at one time powdered gold and powdered silver were used for this purpose. Some coatings on the market to-day render a tablet absolutely insoluble, and therefore defeat the entire plan of medication; just as tablets must be made to disintegrate properly, just so must the coating layers on a tablet disintegrate readily in order that the medicinal ingredients present may be exposed. It is interesting to note that the best ingredient to make tablets disintegrate if incorporated in the coating will do the same work. Potato starch is the agent which excels all others for this purpose. Its use will cause the coating to rupture readily as soon as moisture is applied on account of the rapid swelling of the starch. Just as great care is exercised in tablet making to use as little foreign material in excipients and diluents as is possible, the careful manufacturer of to-day aims to give complete protection to the tablet with the thinnest coating possible. Clumsy heavy coating will be found on the tablets of manufacturers who have not perfected their processes. Have those present ever thought that the sugar coating of almonds by confectioners is done by exactly the same method and that the same apparatus is used as in the coating of tablets? Of course few difficulties are involved in the coating of such things as almonds, and a very ordinary workman is capable of handling this. Perfectly round pills are easier to coat than are the flatter tablets. A perfectly flat tablet is extremely difficult to coat, and is therefore never used. For this reason the punches used by manufacturers are separated into two classes, so far as oval tablets are concerned, one class being known as "Regular Cup," and those intended for future coating as "Deep Cup." A casual thinker must therefore arrive at the conclusion that with the "deep cup" tablets the manufacturer is trying to arrive at as nearly spherical a shape as is possible; this because these tablets will roll more uniformly in the coating basin, and are not nearly so inclined to stick. It must be remembered that every individual tablet, even though half a million are present, must roll independently of the other or it will not gather coating evenly and will show defects in the surface of the finished product.

Humidity is one of the greatest difficulties which has to be met. Moisture interferes very seriously with gelatin, acacia and sugar, and the coating of the same tablets on a dry or a very damp day would necessitate changes in manipulation. This accounts for the use of an air blast which produces dry air, and another in which air of a higher temperature is present. This means that the manufacturer can control the atmosphere in the basin in matters of both temperature and evaporation, for naturally when these coatings are put on in the form of solution the speed with which they evaporate must be controlled. The steam coils surrounding the outside of the basin of course control the temperature of the pan surface. Some tablets must be kept warm while they are being coated, as otherwise they would absorb too much moisture, while others if heated would allow the penetration of the coating solutions; these therefore require that the first surface be applied very rapidly in order to protect the ingredients.

There are some odd coatings used to-day in certain processes. Collodion and balsam tolu are used by some manufacturers on tablets containing ferrous iodide and phosphorus. This work is of necessity very slow. Keratin coating was first developed in Germany for the coating of pills which were not to be acted upon in the stomach, but which were intended to be dissolved in the intestinal fluid. The process was very slow and difficult. It is, as you know, a constituent of horny matter, and is obtained after the same has been freed of all fat present by treating with ether and then digesting the horny material in the form of shavings with a mixture of hydrochloric acid, pepsin and water for about thirty hours in order to remove all material which would be soluble in gastric juice. After proper washings with water the residue is treated with 5% ammonia water, using slight heat, until a complete solution results. This fluid is evaporated to dryness, and the alkaline solution is used on pills containing metallic sulphides, pancreatin, trypsin, etc. Acetic solutions of keratin have been used for coating such products as salicylic acid, arsenic, salts of mercury, creosote, tannin and such like. Tablets intended for this kind of coating first have to be made with some fatty excipient such as cacao butter, pure mutton tallow and either white or yellow wax in various combinations, and must contain no moisture. Salol has largely supplanted the use of keratin, as it also does not permit of the tablets being disintegrated until the intestine is reached. The majority of manufacturers apply the salol (after it has been melted) in about three different coatings. This presents considerable difficulty and the writer has found that the application of the salol mixture with alcohol has proved decidedly better, but can only be applied by a very skilful operator. This general discussion now brings us down to a definite set of processes which at this stage may be readily understood.

COATING PROCESSES.

Removal of Dust.—The first step in the coating of all tablets is the removal of edges. This is done by placing the tablets to be coated in a coating basin and allowing the same to revolve for five minutes. The tablets should then be thrown on a separator and the dust and particles resulting from these edges removed. If allowed to remain these cause rough particles to adhere to the tablets, which cannot be made smooth unless an extremely heavy coating of many layers be put on.

Chocolate Coating.—After removing the edges sufficient syrup and gelatin solution must be added to cover the tablets. This should be poured in slowly from a graduate

and the tablets should not be allowed to mass in the pan. If this is put on sufficiently slowly this may not occur, but if it does the operator must thrust his hand into the mass to prevent surging, and must stir the mass of tablets until they break up and roll free. The next step is the addition of about five dustings of No. 3 powder. This is done by alternate moistening with the syrup and gelatin solution and the dusting on of the powder. The tablets should be allowed to roll for between forty-five minutes and an hour between each dusting. Next, enough chocolate syrup should be applied to remove all dust. The tablets are then rolled for from ten to fifteen minutes. Three or four coats of heavy chocolate syrup are next applied, using the same care to prevent massing, the last two lots of chocolate syrup being diluted with water to one-half their density. This will bring the tablets to a smooth surface. These lots of syrups go on thirty minutes apart. Next enough plain chocolate syrup should be added to bring all tablets uniformly smooth. They are run in this condition for from three to four hours. They should then be put in the polisher with the lumps of polishing wax and run for thirty minutes. This will produce a tablet with the typical brown chocolate coloring, and a splendid polish, and will not have a rusty color.

Coating White Tablets White.—The next type of coating to consider will be the white. This process is more simple then the chocolate coating. After having removed the edges, successive treatments of gum and syrup solution, and coating powder No. 1 are applied. These go on one hour apart for five lots. Plain syrup is then added to settle the dust, and four lots of heavy white syrup are added thirty minutes apart. The tablets are then polished for thirty minutes. It must be noted that the above method is applicable only to white coating of white tablets such as quinine, acetanilide, salol, etc.

Colored Tablets.—In coloring tablets the process is identical except that before polishing plain syrup containing sufficient coloring to produce the desired shade is applied until sufficient color is obtained. The tablets are then polished.

Coating Dark Tablets White.—The coating of dark tablets: First remove all edges as in the preceding cases, then add solution with gum and coating powder No. 4. These should then be rolled for one hour. The next step is the treating four times of the tablets with solution of gum, and coating powder No. 2. These are applied one hour apart. Solution of gum, and one lot of coating powder No. 4, is the next treatment. The tablets are then rolled for one hour. Next is settled all dust with plain syrup. This takes from ten to fifteen minutes. Four lots of heavy white syrup are next applied thirty minutes apart. The tablets are then polished for thirty minutes. Or if color is desired, before polishing plain syrup with sufficient coloring to supply the desired shade is used on the tablet for from three to four hours.

Massing Tendency.—It must be remembered that in applying all solutions, whether of syrup or gum, or their combination, there is the tendency if these are applied too quickly for the tablets to mass and ride the side of the coating basin in solid mass, simply rising and sliding without any movement of the individual tablets. This will cause one tablet to pick the surface from the other with the ultimate result that one tablet will have an uneven projection and the other will be pitted on one side. As soon as this massing condition is noted the operator must thrust his hand into the mass and stir quickly until the individual tablets begin to roll. Large tablets, it will be observed, are not inclined to mass as quickly as do small, because

the small tablets naturally lie closer together. The slow application of the solutions will ofttimes prevent this, and it should be remembered that the various dusting powders applied should be added as nearly uniformly over the whole amount of tablets as is possible, and not simply thrown in one mass. If these precautions are observed a skilful operator may cut down the time of the preceding method by from twenty-five to forty percent. Remember that the rolling of the tablets in the basin after all is the reason for coatings being layered evenly, and the novice should not attempt to coat too rapidly.

Weather Conditions.—Circumstances which play a great part in the coating of tablets are the weather conditions. In humid weather it is not to be expected that syrup and gum will dry as quickly as in dry weather, and the same speed should consequently not be anticipated. Therefore, coating in summer is usually a more troublesome operation than during a winter season.

Drying.—The solutions to be added at the various stages which contain solid ingredients, such as the heavy chocolate syrup, the heavy white syrup, etc., should always be agitated before applying, in order that the solid ingredients contained may not be allowed to settle. Under circumstances where the tablets do not dry sufficiently fast it is extremely helpful to have an air blast which blows directly into the coating basin, thereby setting up a circulation of air, and more quickly removing the moisture. To be able to apply heated air from 120° to 140° F. from these air blasts as well as air at ordinary room temperature will increase the speed with which coating may be done, but should only be used by a skilful operator, as too quick drying will sometimes not allow sufficient roll in the basin to give a smooth tablet. It must be remembered that the perfect coated tablet is one having the thinnest possible coating yet presenting ample protection.

Moist Tablets.—Certain tablets which attract moisture should be dried thoroughly before placing in the coating basin, as too much moisture left in the tablet will affect the coating from the inside with ultimate fracture of the coating. In some cases where a number of vegetable extractives of damp or gummy nature are present it will be found most helpful to apply two or three treatments of 50% solution of gum arabic. This adheres quickly and is preferable to solutions of gelatin which in themselves add moisture to the tablets before they harden sufficiently for the following coating treatments. It must be remembered that all tablets containing volatile ingredients such as camphor, menthol, etc., must be coated quickly, as the rolling of such tablets around in the basin presents ideal exposure for the escape of these substances. The operator in time acquires an intuition which will give him a clue as to just what these peculiar tablets need to protect them in the early stages. Coatings such as those containing beeswax, etc., should not be used as in some cases they render the tablets insoluble and therefore worthless.

Potato Starch.—It will be noted that at some stage in the coating there is applied a powder which contains potato starch. This is necessary as the potato starch when exposed to moisture swells more rapidly than any other agent which can be used and ruptures the coating quickly thus allowing the tablet to disintegrate promptly. Before placing any tablets of this character on sale a fair practical test is to drop some in water at about body temperature and see how quickly the coating will leave the tablet. A point worth remembering is that no accurate colors can be built up except on a perfectly white sub-coating. This is why in the

case of all colored tablets they are coated up to a finished dull white condition before the color solutions are applied.

COATING SEVERAL SIZES OF TABLETS.

If different sizes of tablets are to be coated containing ingredients which are not incompatible, and these tablets are all to be coated the same color, or with a chocolate coating, they may all be placed in the same basin at the same time. We may thus have one-, three- and five-grain tablets which are to be coated. The coating process being identical they are all coated in the one operation, and then separated afterwards by the use of a separator.

Separating.—Separators are not screens in the ordinary sense but are made from sheets of metal having circular perforations. Thus when we place the mixed tablets on a separator, those which weigh only one grain may fall through; when these are removed the remaining tablets are placed on a separator which will permit the three-grain tablets to escape, but the five-grain to remain. This work is so precise and the separator so accurate that there is really no danger of admixture, and three or even four different sizes of tablets of different ingredients may be coated at the time expense of only one coating.

Odd Colors.—A great number of freak colors found in tablets on the market to-day render it necessary to have an operator who is far from color-blind, as very peculiar shades are ofttimes demanded. It is, therefore, wise for the operator to begin with a weak color solution, and build up his shade, as he may otherwise find he has gotten his color too intense from the start. There are to be obtained a vast variety of water-soluble colors which mix very readily in simple syrup solutions, but the operator will be frequently called upon to remember that yellow and blue make green, and that red and blue make purple, and red and black, brown, etc. Color charts such as those supplied by paint manufacturers often prove helpful in selecting and matching shades.

FORMULAS EMPLOYED IN TABLET COATING.

COATING POWDER NO. 1, WHITE.

	Pounds.	Ounces.	Gallons.
Powdered sugar, white	87	2	
Powdered acacia, best	12	14	

COATING POWDER NO. 2.

Calcium carbonate precipitated, white	87	8	
Potato starch, best	12	7	

COATING POWDER NO. 3 (CHOCOLATE).

Powdered chocolate, fat-free	14	8	
Powdered extract of licorice	2	1	
Potato starch	12	7	
Powdered sugar	71		

COATING POWDER NO. 4.

Powdered sugar	88		
Powdered starch	4	8	
Powdered acacia	6	8	

PLAIN SYRUP.

Granulated sugar	40		
Water			3

PLAIN CHOCOLATE SYRUP.

	Pounds.	Ounces.	Gallons.
Chocolate paste	11		
Plain syrup			10

HEAVY CHOCOLATE SYRUP.

Powdered cocoa	20		
Powdered sugar	100		
Plain syrup			10

HEAVY WHITE SYRUP.

Coating powder No. 2	20		
Powdered sugar	50		
Plain syrup			6

SYRUP WITH GELATIN.

Powdered acacia	1		
Best gelatin	1	3	
Granulated sugar	15		
Water			1.625

SOLUTION WITH GUM ACACIA.

Powdered acacia	2		
Granulated sugar	15		
Water			1

POLISHING WAX.

Carnauba wax	3		
Paraffin	2		
Beeswax	2		

A BRIEF HISTORY OF PHI DELTA CHI FRATERNITY.*

BY LEWIS N. BROWN.[1]

The need of a Pharmaceutical Society, an organization that would bring the students of pharmacy together to read and discuss scientific questions pertaining to pharmacy and chemistry, was realized by several students, and approved by Dr. A. B. Prescott, Dean of the College of Pharmacy, at the University of Michigan, in the early eighties.

Therefore on the second day of November 1883, a meeting was held in the room of A. G. Hoffman and Llewellyn H. Gardner, at No. 73 South State St., Ann Arbor, Michigan. At this meeting Dean Prescott and several of the students of the university met and Phi Chi Society, as it was then called, was organized, consisting of the following named charter members—A. G. Hopper, F. H. Frazee, Charles F. Hueber, L. H. Gardner, Charles H. Bond, George P. Leamon, Azor Thurston, A. T. Waggoner, A. S. Rogers, Charles B. Godfrey, and A. G. Hoffman.

At the second meeting, at a somewhat later date, a motion was made and lost to insert the word "Delta" into the name of the Society. At this same meeting permanent officers were elected and the Constitution and By-laws adopted. The officers elected were as follows—L. H. Gardner, *President*, Azor Thurston, *Vice President*, A. G. Hopper, *Recording Secretary*, C. P. Godfrey, *Corresponding Secretary*, C. E. Bond, *Treasurer*, and C. F. Hueber, *Marshall*.

At the next meeting on January 11, 1884, the necessary ritual and regalia were adopted. (At about this time the Society announced itself.)

In August of the same year a motion was made and carried to publish a quarterly to be known as the "Communicator." This quarterly, although somewhat irregular in the past in its publication, is at the present time published regularly and an organ of great good to the fraternity.

Sometime in 1887 the Society was reorganized into a secret Greek Letter Fraternity, and a change in the ritual and regalia was made, together with the adoption of "Signs," "Grip," and "Word" of the fraternity.

In 1895 the fraternity was incorporated as a national organization with "Alpha Chapter of Phi Chi Fraternity" at the University of Michigan, its only chapter, incorporated under Chapter 163-B of Howell's Statutes in the State of Michigan, on January 23, 1896. This statute, however, has since been superseded by Act 171, Public Acts of the State of Michigan in 1903 and amended by Act 148 in 1909.

Due to the confusion in 1909, caused by similarity in name with that of a medical fraternity, the name was changed to "Phi Delta Chi."

From this point until 1918 no event of great historical importance occurred, unless, perchance, the suggestion and discussion at several of the Grand Council meetings to make Phi Delta Chi a Medico-Pharmaceutical fraternity, but has met with no success as the members hold that inasmuch as Phi Delta Chi is the only purely pharmaceutical fraternity it would do the fraternity and its members more harm than good, holding that a mixed fraternity would sooner or later be either the one or the other. "You can not serve two masters for you will love the one or despise the other."

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* Read before Section on Historical Pharmacy, A. Ph. A., New Orleans meeting, 1921.

[1] Gamma '13.

During the World War, in which our country took part in 1918, Phi Delta Chi Fraternity answered the call and sent many to don the uniform of either the Army or Navy, and it will go down in our Fraternal History that the first American, Bro. K. B. Hay, of Epsilon, who died overseas was a member of Phi Delta Chi.

The several chapters were founded as follows:

FOUNDED. CHAPTER ROLL.

Alpha, Nov. 2, 1883, University Michigan, Ann Arbor, Michigan.

Beta, Jan. 6, 1896, Northwestern University (Inactive).

Gamma, Spring 1899, Columbia University, 115 W. 68th St., New York.

Delta, Feb. 12, 1900, University Wisconsin (Inactive).

Epsilon, Mar. 8, 1901, Philadelphia College Pharmacy, Phila., Pa.

Zeta, Mar. 25, 1902, University California, San Francisco, Cal.

Eta, Mar. 29, 1902, Massachusetts College Pharmacy, Boston, Mass.

Theta, Mar. 25, 1904, University Minnesota, Minneapolis, Minn.

Iota, ——— 1905, University Maryland (Inactive).

Kappa, ———1905, University Washington (Inactive).

Lambda, Nov. 8, 1905, University Texas, Galveston, Texas.

Mu, Feb. 26, 1907, University Pittsburgh, Pittsburgh, Pa.

Nu, —— 1907, University Iowa, Iowa City, Ia.

Xi, May 23, 1908, Ohio State University, Columbus, Ohio.

Omicron, May 7, 1909, University Southern California, Los Angeles, Cal.

Pi, Mar. 22, 1912, University Nebraska, Lincoln, Neb.

Rho, May 23, 1913, University Oklahoma, Norman, Okla.

Sigma, Apr. 17, 1914, University Colorado, Boulder, Col.

Tau, Nov. 17, 1916, Purdue University, West Lafayette, Ind.

Upsilon, Feb. 22, 1917, Kansas University, Lawrence, Kans.

Phi, Mar. 9, 1920, Creighton University, Omaha, Neb.

Chi, Apr. 9, 1921, Auburn Polytechnic Institute, Auburn, Alabama.

GRAND COUNCIL MEETINGS.

Place.	Date.	Guest of Chapter.
Chicago, Ill.	Apr. 12, 1900	*Beta*
Ann Arbor, Mich.	1901	*Alpha*
Chicago, Ill.	1902	*Beta*
New York City	Apr. 10, 1903	*Gamma*
Philadelphia, Pa.	Feb. 8, 1904	*Epsilon*
Boston, Mass.	Feb. 23, 1905	*Eta*
Chicago, Ill.	Mar. 24, 1906	*Beta*
Baltimore, Md.	Mar. 18, 1907	*Iota*
Minneapolis, Minn.	Feb. 20, 1908	*Theta*
Chicago, Ill.	Mar. 4, 1909	*Beta*
New York City	Mar. 1, 1910	*Gamma*
Ann Arbor, Mich.	May 3, 1911	*Alpha*
Boston, Mass.	Feb. 15, 1912	*Eta*
Chicago, Ill.	Feb. 13, 1913	*Beta*
Columbus, Ohio	Feb. 6, 1914	*Xi*
San Francisco, Cal.	Aug. 12, 1915	*Zeta*
Minneapolis, Minn.	Feb. 7, 1916	*Theta*
Lincoln, Neb.	Feb. 19, 1917	*Pi*
No meeting in 1918.		
Chicago, Ill.	Apr. 14, 1919	——
St. Louis, Mo.	Mar. 5, 1920	——
Indianapolis, Ind.	Mar. 3, 1921	——

A BRIEF HISTORY OF THE KAPPA PSI FRATERNITY.*

BY A. RICHARD BLISS.[1]

The Kappa Psi Fraternity is of special interest to pharmacy and pharmacists because of the fact that it is the only national, Greek letter, professional society that admits to membership on a full and equal basis graduates and students of the sister professions Medicine and Pharmacy. It enjoys the further distinction of being the oldest of all medical and pharmaceutical fraternities, having been founded on May 30, 1879; of having the longest chapter roll (49 living collegiate chapters, 29 living graduate chapters, and 8 inactive collegiate chapters, a total of 86 chapters);

* Read before Section on Historical Pharmacy, A. Ph. A., New Orleans meeting, 1921.

[1] Grand Registrar, and Editor, *Mask*.

and of having the largest membership, the 1920–21 roll showing a total membership of 10,959.

The organization was founded as a medical fraternity at the Medical College of Virginia in 1879, the founders of the chapter at Virginia having been members of the academic society of Kappa Psi which had been founded at the Russell Military Academy of New Haven, Conn., during the spring of the same year. This academic society was founded on the basis of an older academic society of the same name in which the father of the founder of *academic* Kappa Psi (Mr. F. Harvey Smith) held membership. The academic society expanded as follows: 1879, Russell Chapter, Russell Military Academy; 1879, Cheshire Chapter, Cheshire Military Academy (Cheshire, Conn.); 1886, Hillhouse Chapter, Hillhouse High School (New Haven, Conn.); 1886, Yale Chapter, Yale College. The majority of the graduates of the academic chapters entered medical schools in the fall of 1879, and the first medical chapter, Beta, mentioned above, in the Medical College of Virginia, was installed that year.

At a national convention in 1887 it was decided to establish chapters in medical schools only, to discontinue the four academic chapters, and to continue as a strictly professional fraternity. Ten years later, recognizing pharmacy as an important, inseparable *branch and specialty* of medicine and realizing the important work that might be done among physicians and pharmacists, as well as among students of these sister professions, through its influence and teachings, the fraternity in convention assembled decided to admit to full and equal membership pharmacy students and graduates of the desired calibre in high grade schools *only*. Thus, Kappa Psi entered upon its important mission of encouraging and promoting in a practical way a greater feeling of fellowship, brotherhood and *coöperation* between the members of the reunited profession of Medicine and Pharmacy. Its remarkable growth and strength attest the success of the organization and prove its right to exist.

The governing body, called "Alpha Chapter," was placed first on the new chapter roll which grew as follows:

Founded.	Chapter.	Membership.
1879.	*Alpha*, Grand Council	5
1879.	*Beta*, Medical College of Virginia	193
1888.	*Gamma*, Columbia University	511
1898.	*Delta*, University of Maryland	454
1901.	*Epsilon*, Maryland Medical College (*merged with Delta*, 1914)	178
1902.	*Zeta*, Georgetown University (1906)	94
1903.	*Eta*, Philadelphia C. of P.	471
1904.	*Theta*, University College of Medicine	20
1905.	*Iota*, University of Alabama	216
1906.	*Kappa*, Birmingham Med. Col. (*now Grad. Sch. of Med., Univ. of Ala.*, 1915)	192
1907.	*Lambda*, Vanderbilt University	215
1907.	*Mu*, Massachusetts C. of P.	270
1907.	*Nu*, Medical College of South Carolina	105
1908.	*Xi*, University of West Virginia	96
1908.	*Omicron*, University of Nashville (*merged with Vanderbilt*, 1912)	86
1908.	*Pi*, Tulane University	264
1909.	*Rho*, Emory University	274
1909.	*Sigma*, Baltimore C. of P. & S. (*merged with Univ. of Md.*, 1915)	187
1909.	*Tau*, Univ. of Ala. (Tuscaloosa) (*preclinic school discontinued; merged with Iota*, 1913)	14
1909.	*Upsilon*, Louisville C. of P.	153
1910.	*Phi*, Northwestern University	215
1910.	*Chi*, University of Illinois	317
1910.	*Psi*, Baylor University	109
1910.	*Omega*, Southwestern University (*merged with Baylor*, 1915)	102
1910.	*Beta-Beta*, Western Reserve University	168
1910.	*B-Gamma*, University of California	253

1910. *B-Delta*, Union University (Albany, N. Y.) 305
1911. *B-Epsilon*, Rhode Island College of P. & A. S. 215
1911. *B-Zeta*, Oregon State College 182
1912. *B-Eta*, Jefferson Medical College 216
1913. *B-Theta*, University of Tennessee 221
1913. *B-Iota*, North Pacific College 124
1913. *B-Kappa*, University of Pittsburgh 685
1914. *B-Lambda*, George Washington University 122
1914. *B-Mu*, University of Louisville 149
1914. *B-Nu*, Creighton University 95
1915. *B-Xi*, University of North Carolina 125
1916. *B-Omicron*, University of Washington 102
1916. *B-Pi*, Washington State College 85
1917. *B-Rho*, Loyola University (Chicago) 152
1917. *B-Sigma*, Fort Worth School of Medicine 29
1917. *B-Tau*, Marquette University 24
1918. *B-Upsilon*, Long Island Hospital Medical College 58
1918. *B-Phi*, University of Texas 38
1919. *B-Chi*, University of Cincinnati 10
1919. *B-Psi*, University of Wisconsin 56
1920. *B-Omega*, Johns Hopkins University 11
1920. *Gamma-Gamma*, College of P. & S., New York 26
1920. *G-Delta*, Ohio Northern University 55
1920. *G-Epsilon*, University of Nebraska 30
1920. *G-Zeta*, University of Toronto 16
1920. *G-Eta*, University of Montana 21
1920. *G-Theta*, Tufts Medical College 15
1920. *G-Iota*, University of Buffalo 41
1920. *G-Kappa*, University of Georgia 7
1921. *G-Lambda*, University of Penna 8
1921. *G-Mu*, University of Oregon 10
1921. *G-Nu*, Harvard University 12

The alumni of the fraternity are organized into graduate chapters which have the same rights and privileges as the collegiate chapters. They are termed "Graduate Beta," "Graduate Gamma," etc. The graduate chapter roll follows:

Graduate *Beta* ..... Philadelphia, Pa.
Graduate *Gamma* ..... New York, N. Y.
Graduate *Delta* ..... Baltimore, Md.
Graduate *Epsilon* ..... Birmingham, Ala.
Graduate *Zeta* ..... Chicago, Ill.
Graduate *Eta* ..... Boston, Mass.
Graduate *Theta* ..... Albany, N. Y.
Graduate *Iota* ..... Providence, R. I.
Graduate *Kappa* ..... San Francisco, Calif.
Graduate *Lambda* ..... Cleveland, Ohio
Graduate *Mu* ..... Atlanta, Ga.
Graduate *Nu* ..... New Orleans, La.
Graduate *Xi* ..... Mobile, Ala.
Graduate *Omicron* ..... Dallas, Texas
Graduate *Pi* ..... Greensboro, N. C.
Graduate *Rho* ..... Washington, D. C.
Graduate *Sigma* ..... Nashville, Tenn.
Graduate *Tau* ..... Memphis, Tenn.
Graduate *Upsilon* ..... Richmond, Va.
Graduate *Phi* ..... Charleston, S. C.
Graduate *Chi* ..... Brooklyn, N. Y.
Graduate *Psi* ..... Portland, Ore.
Graduate *Omega* ..... Jacksonville, Fla.
Graduate *B-Beta* ..... Louisville, Ky.
Graduate *B-Gamma* ..... Charleston, W. Va.
Graduate *B-Delta* ..... Illinois State
Graduate *B-Epsilon* ..... Mississippi State
Graduate *B-Zeta* ..... Huntington, W. Va.
Graduate *B-Eta* ..... Omaha, Nebr.

On November 17, 1917, the Delta Omicron Alpha Medical Fraternity was merged with the Kappa Psi Fraternity. This organization was founded in the College of Medicine of Tulane University in New Orleans in 1907, and established the following chapter roll up to time of the merger:

1907. *Alpha*, Tulane University 216
1908. *Beta*, Columbia University 84
1910. *Gamma*, University of Tennessee 129
1910. *Delta*, Southwestern University (1915) 98
1911. *Epsilon*, University of Alabama 169
1912. *Zeta*, Birmingham Medical College (1915) 77
1912. *Eta*, Fort Worth School of Medicine 128
1914. *Theta*, Chicago Col. of Med. & Surg. 162
(Total Delta Omicron Alpha Chapters, 8. Total membership, 1,063.)

The Delta Omicron Alpha fraternity published a constitution and by-laws and a ritual. The government was of the usual "Grand Chapter" form and conventions were held annually. The fraternity badge was a triangle of gold and black enamel,

with the Greek letters "Delta Omicron Alpha" in the center of a black enamel field with a star above and a serpent below; the margin was jeweled.

On January 26, 1918, the Phi Delta Medical Fraternity was merged with the Kappa Psi Fraternity. This organization was founded at the Long Island Hospital Medical College in 1901. The chapters were all termed "Alphas" and the roll was as follows:

1901. *A-Alpha*, Long Island Hospital Medical College 205
1902. *A-Beta*, Ohio State University 102
1902. *A-Gamma*, Union University (Albany, N. Y.) 128
1903. *A-Delta*, Wisconsin College of P. & S 78
1903. *A-Epsilon*, Kansas University Medical College (1910) 54
1903. *A-Zeta*, Washington University 106
1903. *A-Eta*, Michigan College of Med. & Surg 89
1904. *A-Theta*, Sioux City Medical College (1909) 41
1904. *A-Iota*, Toronto University 1910) .. 31
1904. *A-Kappa*, Columbia University (1911) 23
1904. *A-Lambda*, Dearborn Medical College (1908) 35
1904. *A-Mu*, University of Minnesota 88
1905. *A-Nu*, Chicago College of Med. & Surg 140
1905. *A-Xi*, St. Louis University 92
1906. *A-Omicron*, University of Illinois 84
1912. *A-Pi*, Loyola University 75

(Total Phi Delta Chapters, 16. Total membership, 1,371.)

Each of the Phi Delta Chapters rented a house. The fraternity published a year book called "Black and Gold," a ritual, and a constitution and by-laws. The government consisted of the usual "Grand Chapter," and conventions were held triennially either in New York or in Chicago. The fraternity badge was a monogram of the fraternity letters, "Phi" and "Delta," the "Phi" superimposed over the latter and the chapter letters inserted in the ring of the letter "Phi." The flag was a black pennant with a red Geneva cross in the center, with the fraternity letters in gold to the right and left of the cross.

RECAPITULATION.

Kappa Psi Alpha Chapter	1
Kappa Psi Collegiate Chapters	57
Delta Omicron Alpha Collegiate Chapters	8
Phi Delta Collegiate Chapters	16
Graduate Chapters	29
Academic Chapters (extinct)	4
Total Chapters	115
Total Membership	10,959

The following chapters of Kappa Psi were formed from local organizations: *Eta* from Delta Gamma Phi; *Upsilon* from Pi Mu; *Phi* and *Chi* from the Alpha and Beta chapters of Phi Gamma Sigma; *Omega* from Kappa Lambda; *Beta-Epsilon* from Psi Beta; *Beta-Kappa* from the Beta chapter of Beta Phi Sigma; *Beta-Omicron* from Beta Psi; *Beta-Pi* from Sigma Gamma; *Beta-Rho* and *Beta-Sigma* from the Eta and Theta chapters of Delta Omicron Alpha and the Alpha-Nu and Alpha-Pi chapters of Phi Delta; *Beta-Upsilon* from A-A of Phi Delta; the *Phi Beta Delta* fraternity was merged with *Eta* in 1917.

The fraternity is divided into five provinces. It publishes its Constitution and By-laws; *The Agora*, an esoteric publication which contains the directory and which was published annually from 1903 to 1910 and since then every three years; *The Mask*, a periodical, issued every month during the college years from 1903 to 1910, and since then issued as a quarterly; and a song book.

The fraternity is governed by "Alpha Chapter" or the Grand Council which has met in annual conventions from 1879 to 1908, and since then biennially. During the interim between sessions, the administration of the fraternity affairs is in the hands of the Grand Officers. The provinces meet in biennial conventions on the alternate years to the national conventions.

The fraternity colors are scarlet and cadet-gray. The flower is the red carnation. The badge is a diamond displaying a mask raised from the face of the black enamel center. The Greek letters "Kappa" and "Psi" appear one above and one below the mask. The eyes of the mask and the border of the badge may be jeweled.

To stimulate scholarship the Grand Council or governing body awards annually gold keys to those members of the collegiate chapters who make first honors at graduation. The great majority of the individual collegiate chapters also co-operates in the work of advancing scholarship and research by awarding chapter scholarship medals, cups, etc. One collegiate chapter has already established a free scholarship and a number of others have begun such funds. The majority of the chapters that have established scholarship awards, offers them for "open competition;" that is, non-members as well as members may compete for them.

Over seventy-five percent of the collegiate chapters occupy chapter houses; two chapters have purchased their chapter houses; and practically every chapter has organized a chapter house purchase campaign or fund.

In a paper of this kind it is customary to mention the more prominent graduate members. Time and space, however, force us to limit the list of such members to some of those who are members of school and college of pharmacy faculties. There are numerous prominent members and leaders in all the branches and divisions of the medical sciences, and we regret that we are not permitted to compile at this time a rather complete list. A partial list of "faculty Kappa Psis" follows:

Dean H. H. Rusby, Associate Dean G. C. Diekman, Dr. C. P. Wimmer, Dr. W. C. Ballard, Prof. J. Hostmann, and Dr. H. H. Schaefer of Columbia University; Dean Wm. Mansfield, Prof. E. C. Hutman, Prof. W. A. Larkin, Dr. E. S. Haswell, of Union University; Dr. R. F. Morgan and Dr. A. B. Lemon of the University of Buffalo; Dr. George Hohmann of Fordham University; Dean E. V. Howell and Prof. J. C. Beard of the University of North Carolina; Dean R. H. Raabe of Ohio Northern University; Dean E. Spease of Western Reserve; Dr. W. C. Alpers, late Dean at Western Reserve and Past-President of the A. Ph. A.; Doctors Vanderkleed, Pittenger, Youngken, Fitzkee and Griffith of P. C. P.; Dean J. A. Koch, Doctors Saalbach, Darbaker, and Blumenschein of Pittsburgh; Dean E. E. Calder of Rhode Island; Dr. A. H. Brundage, formerly of R. I. C. of P.; Dean Robt. Wilson, Jr., and Dr. W. H. Zeigler of South Carolina; Dean E. H. Cary; Prof. E. G. Eberle, formerly Dean of the Pharmacy Department, and Dr. C. R. Stewart of Baylor University; Dean W. F. Rudd, and Doctors W. G. Crockett, R. W. Miller, and L. C. Bird of the Medical College of Va.; Dean Chas. W. Johnson of the Univ. of Washington; Dean P. H. Dirstine of Washington State; Dr. H. A. Langenhan of Wisconsin; Dr. W. B. Philip of California; Dean C. A. Struby of Mercer University; Dean W. B. Day of Illinois; Dean O. C. Dilly of Louisville; Dean T. J. Bradley of Massachusetts; Dean E. F. Kelly of Maryland; Dean C. E. Mollet of Montana and Doctors V. J. Fitz-Simon and C. E. Gilland of Creighton University.

As already stated, the list is by no means complete; and, if we had the time and space, dozens of additional faculty members could be added to the list. Furthermore, the long list of faculty members in the medical schools has not been included. The fact that Kappa Psi stands for *scholarship*, industry, sobriety, mutual fellowship and esteem, nobility and courage of mind and heart, the advancement of science and research, and *clean, strong manhood* is doubtless a major reason for its striking array of leaders in the medical and pharmaceutical sciences.

THE DEPARTMENT OF THE AMERICAN CONFERENCE OF PHARMACEUTICAL FACULTIES

[EDITOR'S NOTE.—The editor asked Prof. Zada M. Cooper, of the University of Iowa, to enumerate, first, a list of books and periodicals which she considered absolutely essential as a nucleus for a pharmaceutical library; secondly, to state what type of books and periodicals in pharmacy and the related sciences should be added as the library grows beyond the bare fundamentals necessary for a working library. We appreciate the tangibleness of her answer.

Dean Edward Spease, of Western Reserve University, has complied with the editor's request for an expression as to what he thinks "Experience" should consist of in the training of a modern pharmacist.

In September 1921 the University of Washington at Seattle dropped the two-year course in pharmacy. Dean C. W. Johnson's description of the effects which this had upon registration, upon the attitude taken by the student body, and upon the sympathetic position taken by the pharmacists and laymen of the state, will be read with intense interest by every one interested in advancing professional and educational requirements for pharmacy.

RUFUS A. LYMAN, Chairman Executive Committee and Conference Editor.]

BOOKS ESSENTIAL FOR A PHARMACEUTICAL LIBRARY.

BY ZADA M. COOPER.

Certain books and periodicals are absolutely essential for the beginning of a library in any college of pharmacy, the "irreducible minimum" in other words. No two people would agree on such a list, for the making of it is somewhat like selecting the ten best novels or the ten best essays in English literature. However, each would choose two or three that he believed to be best on each subject. The submission of this list may call forth an avalanche of criticism but if any of us are benefited the writer should be satisfied.

United States Pharmacopoeia VII, VIII and IX.
National Formulary III and IV.
National Standard Dispensatory.
United States Dispensatory.
British Pharmacopoeia.
German Pharmacopoeia.
British Pharmaceutical Codex.
REMINGTON—Practice of Pharmacy.
ARNY—Principles of Pharmacy.
CASPARI—Treatise on Pharmacy.
SCOVILLE—Art of Compounding.
RUDDIMAN—Incompatibilities in Prescriptions.
STURMER—Pharmaceutical Arithmetic.
STEVENS—Arithmetic of Pharmacy.
STURMER—Pharmaceutical Latin.
MERCK—1907 Index.
HOLLEMAN-COOPER—Inorganic Chemistry.
SMITH (ALEXANDER)—Inorganic Chemistry.
CADY—Inorganic Chemistry.
COHEN—Organic Chemistry.
CLARKE—Organic Chemistry.
NORRIS—Organic Chemistry.
RICHTER—Organic Chemistry.
NOYES—Organic Chemistry.
SUDBOROUGH and JAMES—Practical Organic Chemistry.
SCHIMPF—Qualitative Analysis.
SCHIMPF—Volumetric Analysis.
COBLENTZ—Volumetric Analysis.
OLSEN—Quantitative Chemical Analysis.
BLOXAM—Chemistry, Inorganic and Organic.
TREADWELL and HALL—Analytical Chemistry, Qualitative.
TREADWELL and HALL—Analytical Chemistry, Quantitative.
GOOCH—Methods in Chemical Analysis.
DAGGETT—Pharmaceutical Chemistry.
STANISLAUS and KIMBERLY—Pharmaceutical Chemistry.
SADTLER and COBLENTZ—Pharmaceutical and Medical Chemistry.
COHN—Indicators and Test Papers.
MULLIKEN—Identification of Pure Organic Compounds, Vols. I, II, III.
SHERMAN—Organic Analysis.
ALLEN—Commercial Organic Analysis, Vols. I to IX.
LEACH—Food and Drug Analysis.
FULLER—Chemistry and Analysis of Drugs and Medicines.
NELSON—Analysis of Drugs and Medicines.
LYON—Practical Standardizing of Organic Drugs.
ASHLEY—Chemical Calculations.
MERCK—Chemical Reagents, Their Purity and Tests.
MURRAY—Standards and Tests for Reagent Chemicals.
SEIDELL—Solubilities of Inorganic and Organic Substances.
CUSHNY—Pharmacology and Therapeutics.
POTTER—Therapeutics, Materia Medica and Pharmacy.
BASTEDO—Materia Medica.
WILBERT—Pharmacology of Useful Drugs.

FRANCIS-FORTESCUE-BRICKDALE—Chemical Basis of Pharmacology.
CULBRETH—Materia Medica and Pharmacology.
KRAEMER—Scientific and Applied Pharmacognosy.
SAYRE—Materia Medica and Pharmacognosy.
YOUNGKEN—Pharmacognosy.
YOUNGKEN—Pharmaceutical Botany.
GRAY—Manual of Botany.
MACBRIDE—Lessons in Botany.
BASTIN—College Botany.
HAWK—Physiological Chemistry.
HAMMERSTEN and HEDIN—Physiological Chemistry.
ABDERHALDEN—Physiological Chemistry.
ROCKWOOD—Physiological Chemistry.
SIMON—Physiological Chemistry.
JORDAN—General Bacteriology.
SCHNEIDER—Pharmaceutical Bacteriology.
STITT—Practical Bacteriology, Blood Work and Animal Parasitology.
MACLEOD—Physiology.
GILDEMEISTER and HOFFMAN—Volatile Oils.
LEWKOWITSCH—Chemical Technology of Oils, Fats and Waxes.
EULER-POPE—Chemistry of the Enzymes.
CONHEIM—Enzymes.
MITCHELL—Modern Urinology.
GRADWOHL—Blood and Urine Chemistry.
MOLINARI—Industrial Chemistry, Inorganic.
MOLINARI—Industrial Chemistry, Organic.
ROGERS—Industrial Chemistry.
PICTET and BIDDLE—Vegetable Alkaloids.
WEBSTER—International Dictionary.
LIPPINCOTT—Medical Dictionary.
WEBBER—Technical Dictionary (English, French, Italian, German).
Editorial Staff of Chemical Engineering Catalog—Chemical Dictionary.
JACKSON—Glossary of Botanic Terms.
LYONS—Plant Names, Scientific and Popular.
RAND and MCNALLY—Atlas of the World.
JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, Volumes 1 to 10 (1912–1921).
Druggists' Circular, Volumes 61 to 65 (1917–1921).
American Druggist and Pharmaceutical Record, Volumes 65 to 69 (1917–1921).
American Journal of Pharmacy, Volumes 89 to 93 (1917–1921).

Besides the complete volumes of the journals just mentioned the library should be receiving the current issues of each and also *Drug and Chemical Markets* and *Merck's Report*. *Many more ought to be included:* these seem to me the very smallest number allowable.

This list of books is selected chiefly with the student in mind but no library can be limited to books for student use only. When the needs of the teaching staff are considered the list grows larger and more varied.

If I were asked to say what sort of books the library of a college of pharmacy should contain, I should add numerous other lines not touched at all in the above list. When one remembers that pharmacy touches life at many points, the scope grows broad.

There should be a historical section containing histories of pharmacy like "Wootton's Chronicles," histories of medicine and histories of chemistry. Another section should be devoted to biography: lives of eminent pharmacists, physicians and chemists. Fiction, too, has its place; any story that touches in any way any phase of pharmacy or chemistry or medicine or in which pharmacists are depicted should be included.

There should be books on water analysis, dairy products, microscopy, physics and photography; dyes, pigments, varnishes, bleaching and cleaning; economics, accounting, arithmetics of pharmacy, chemistry and business; correspondence, advertising, and show card writing. There must be a shelf devoted to laws affecting pharmacy and pharmacists. Several others will be filled with formularies. Government bulletins contain much valuable information and the various publications of the Council of Pharmacy and Chemistry of the American Medical Association are a necessity.

The list given above seems pitifully small but since the biggest and finest libraries have small beginnings these might constitute the nucleus.

The library of the College of Pharmacy at Iowa University is not large, numbering only forty-three hundred volumes, but considering the comparative youth of the college and the fact that most of the material is of value *now* and is being used

now, it perhaps makes a creditable showing. A few years ago we completed our sets of a few of the leading journals as well as those of the leading dispensatories and the "United States Pharmacopoeia." Aside from these we have little that is old and we are getting each new thing or each new edition of every worth-while book as soon as possible after it is off the press.

We get regularly about thirty journals. These include all of the best pharmaceutical journals published in this country, two English, one Canadian, one Australian and one German. All are pharmaceutical except three, the *Journal of the American Medical Association*, the *Journal of Pharmacology and Therapeutics* and *The Merchants Record and Show Window*. No chemical journals are taken because the department of chemistry gets those and they are accessible to students of pharmacy, the chemical library opening directly from the laboratory of general chemistry. Incidentally it might be added that there are in the chemical library several thousand volumes on strictly chemical subjects and files of all the leading chemical journals for a number of years. Approximately half of the pharmaceutical journals are being bound, the less important ones, particularly those that are not indexed, being omitted.

Our library is largely used. Every student in the college spends some time there and the better ones many hours. The library opens into the main pharmaceutical laboratory and throughout laboratory periods students come and go for a few minutes at a time. During vacant periods between classes and at other times the room is filled with students at work. No "library reading course" is given and there is no specific requirement about the amount of reading to be done. When our shortest course becomes one of three years such a course may possibly be given. Most courses, particularly recitations in practical pharmacy which are correlated with actual laboratory work, give opportunity for use of many reference works. This is especially true of all work after the first year. Many preparations are made by unofficial formulas and for all of these as well as many official ones reference reading becomes important. It is still more true of drug assaying and all third and fourth year work.

Surely a good library is as important a part of a college of pharmacy as its laboratory equipment.

STATE UNIVERSITY OF IOWA,
IOWA CITY, IOWA.

* * * * *

THE EXPERIENCE CHIMERA.

BY EDWARD SPEASE.

Had I been asked to write such an article as this ten years ago I should have responded with alacrity, for then as a laboratory assistant I felt I knew all things pharmaceutical, but in these days I find even I can take another's suggestion occasionally and profit by it.

Before one attempts to discuss the value of "experience," or its lack of value, it might be well to think a moment about what the word "experience" in pharmacy means. Also would it not be well to discuss just what advocates of compulsory experience mean by it?

Experience in pharmacy really means practice in the manufacturing of substances intended for direct sale or to be used in prescriptions, the compounding

of actual prescriptions and the rendering of pharmaceutical service to the physician and to the public. Experience or time spent in a retail drug store may mean the above alone or this coupled with experience in merchandising or it may mean merchandising only. It may mean merchandising experience such as can be obtained in a grocery or a meat market.

No one will gainsay the fact that a young man or woman who has never been in a retail store, no matter what his education, is not as proficient as one who has been in one for some months or some years. This experience is, then, ability to put dollars into the owner's cash register. Is this the experience teachers and boards are talking about or is it the experience meant when mentioned by the retail trade?

I believe we are not all talking about the same thing. As to experience in retail merchandising, I am willing to grant to the retail druggist that it is a desirable asset to find in a clerk one is about to hire, though even then sometimes the druggist may have to overcome some undesirable experience. Much can be said upon this particular kind of experience. One might add that to require such an apprenticeship will guarantee cheap help in the store.

Some druggists base salaries upon the years of experience. I sometimes question the wisdom of both the cheap help and the years of experience when neither is coupled with ability, general education and personality. I firmly feel that many stores, even though successful, would be eminently more so if they secured services of men who were better educated and not just hand trained. I also firmly feel that it is better for a store to start in with a clerk who has had an education than to start in with one who merely wishes a job and thinks he would like pharmacy, or perchance one who cannot enter any type of school or training and takes up the drug store as a last resort.

I wonder how many druggists interview a boy, when expecting to start one in the store, with only the idea in mind as to whether he can make a satisfactory clerk or errand boy, and not as to whether he will make a pharmacist as well. Is he fitted with health, character and antecedents sufficient to build a pharmaceutical career upon? How many druggists in the past have taken in a knotty stick and have then been disappointed because a school feels that it is wasting its time and valuable equipment in trying to turn out a serviceable piece of furniture? There is such a thing as school efficiency as well as business efficiency.

A school must select its raw material if the world is to put the stamp of approval and satisfaction upon the finished product. If others, as retail druggists, are to select the raw material, then it must be according to approved specifications.

The board must serve as the final inspectors of finished products and must not set the standards so low that the market will be flooded with shoddy material.

If a school so arranges its curriculum that a student learns to manufacture, compound and dispense, and thus becomes a proficient pharmacist, why require this student to learn to merchandise in things other than pharmaceutical products before giving him final inspection by the boards and permitting him to practice? Are we aiming by experience to give the druggist an efficient salesman or are we expecting to give the public safe pharmaceutical service? If one attends school every day throughout the academic year for four years and is graduated and the

board pronounces him proficient, why require this other thing that we all know is unworthy of us?

If the school course is solely didactic, as was the case once upon a time, the laboratory (store) experience becomes a necessity, but the time for this is gone by.

A few three-month places, so-called schools, still exist, but these will be eliminated as fast as the personnel of our boards (inspectors of finished products) become sufficiently educated to recognize high-class material from that covered up with showy paint. I do not make this statement to reflect upon any board member but merely to bring home the fact that the pharmaceutical practice or experience should be gained in the schools, in their laboratories and in the connecting hospitals. If the school does not furnish such experience students must be sent to the drug store before they are turned out as finished products.

Once more let me reiterate my opinion that the day of the need for experience of the kind most often mentioned is gone by and the experience most often referred to is merely a chimera. Let us have educated men and women in pharmacy and keep in mind that the youth coming to us is no longer deluded by this time-worn excuse to keep him from the place where he belongs.

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THE THREE-YEAR COURSE AT THE UNIVERSITY OF WASHINGTON COLLEGE OF PHARMACY.

BY C. W. JOHNSON.

The University of Washington College of Pharmacy decided about the middle of the school year of 1920–21 to drop the two-year course. This action was taken after thorough discussion by our faculty and a careful investigation of the probable effects of this action, by securing opinions from students then enrolled in the college, alumni and other practical pharmacists in the state and of principals of several of the high schools. It is possible that this college of pharmacy is more fortunately located than some other colleges of the country, but we learned by investigation in the high schools that students expecting to go to the university thought *only* in terms of a four-year course. The practical pharmacists expressed themselves as being in favor of more extended training, particularly so, if part of it could be training for the business side of pharmacy. Many of the freshmen then in college as candidates for the two-year degree stated that if the two-year course were dropped they would not want to receive the two-year degree but would continue for the three- or four-year degree.

With this data in mind we decided to make the change and not give notice in advance in order to attract a large "last" class for the shorter course. This change was announced in the bulletin of the college for 1921–22, issued in the spring of 1921, merely by *not* including a two-year curriculum. Notice was given the drug trade through the *Pacific Drug Review* and at the annual meeting of the Washington State Pharmaceutical Association.

We were, of course, much interested to get the final figures of enrolment at the opening of the present college year and were well satisfied to learn that the freshmen enrolment of fifty-four for the three-year course was only ten less than the freshmen enrolment of the year previous when most of them, presumably were

entering for the two-year course only. It is also worthy of notice that the total enrolment of the college showed a gain over the previous year and that the College of Pharmacy was the only college in the University that showed such a gain, the loss in enrolment in the University as a whole being due to stringent financial conditions of this section of the country and to higher tuition fees for all students which kept many students out of college.

We have at the University of Washington a well-organized and very popular College of Business Administration. It occurred to the faculty of the College of Pharmacy that in this three-year course we could allow students, who planned to go into retail pharmacy, opportunity to elect certain business administration courses that would better prepare them for the business side of pharmacy. We therefore arranged with the College of Business Administration to have our students admitted, first, into a course in economics as a basis for future training and, later, into courses in business law and accounting. We then extended the curriculum to one of four years combining business training with pharmacy. This curriculum would of course in no way supplant our four-year scientific course. We thought that if 1500 students would attend a College of Business Administration for four years of training to enter purely business pursuits, possibly pharmacy students would come for four years to secure a combined professional and business training. This opinion has been fully justified by the number who expect to complete this four-year combined course. Courses in salesmanship, advertising, business management, money and banking, income tax, etc., are open to pharmacy students.

The change to a minimum three-year curriculum has allowed us to more than double the amount of prescription training that a student can obtain. This work we wish particularly to emphasize. We have increased the work in manufacturing pharmacy by one-half, have extended the work in drug assay and have been able to place in the third year the courses that demand the prerequisite training of the first and second years.

The change in curriculum has stimulated the interest of our present sophomore class and many have stated that they do not want to receive a two-year degree next June but will come back for a third year so as to be as well prepared as our present freshman class will be when it graduates. A considerable number of our students have also stated that if they are to complete three years for a degree why not come full four years and receive a bachelor's degree, one that will always mean something to them? We therefore confidently expect greatly increased junior and senior classes. We are now looking forward to a time in the near future when we will have the normal number of seniors left out of a freshman class that any other four-year course in liberal arts, science or engineering has and then we will offer only a four-year course in pharmacy in this college. The pharmacists of the state of Washington join with the University in desiring *quality* in training rather than *quantity* in graduates.

We also find that our graduate work leading to the Master of Science degree is developing much interest among underclassmen. Seniors, juniors and even sophomores and freshmen come to members of the faculty and discuss the opportunities for graduate work and the openings for men with such training.

When it is mentioned that the students as a whole seem anxious to get the best training possible and think in terms of the Bachelor's degree as being the only degree worth while, it must not be assumed that those students have unlimited means with which to go to school. Careful investigation shows that 80% of our pharmacy students are wholly or partly self-supporting and that fully 50% are wholly self-supporting. The means for earning this support cannot be discussed here but the attitude of the student is worthy of notice for it shows clearly that the lack of funds is really no bar to a student who has the interest and ambition to get the best there is.

We feel that the dropping of the two-year course has done more for this college than any other change in our plans has accomplished in many years. It has stimulated interest in pharmacy among high school principals, practical pharmacists, prospective students and among students in other colleges on the campus to a great degree. We are more than satisfied with the change and would not think of returning to the shorter course. Not one word or letter of protest has been received from a pharmacist of the state of Washington while many letters and other expressions of approval come to us for making the change.

The opinion is unanimous in this state, among persons interested, that the pharmacist should be broadly trained so that he may take his place in the community along with other broadly trained professional and business men, and that it is his duty not alone to serve the professional wants of his locality but that he should also help to serve the economic and social needs of the city in which he lives. This college of pharmacy helps to foster this idea and desires to graduate only such men and women as will realize this responsibility and take time to prepare themselves for it.

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SHALL "PATENTS" BE INCLUDED IN THE PHARMACEUTICAL CURRICULUM?

BY L. E. SAYRE.

One of the most significant and far-reaching suggestions for the improvement of the profession of pharmacy is that which concerns itself with the standardization of schools and universities which offer courses leading to the degrees of Graduate in Pharmacy, Pharmaceutical Chemist and Bachelor of Science in Pharmacy. Standardization of schools and colleges has done so much to elevate the profession of medicine that any similar standardization should be very welcome to all pharmacists who love their profession and wish to see it respected by the public.

It has recently been proposed that there be included in the pharmaceutical curriculum of standardized schools a certain amount of teaching of, or the handling of, "patent medicines." This, it is assumed, is for the purpose of giving the prospective pharmacist some familiarity with the large number of proprietary articles which he later will be called upon to—I was about to say—dispense, but in the interest of truth must say "hand out."

Such a proposition, of course, assumes that patent medicines, as a side-line, or otherwise, are a necessary part of the drug stock. There are many ultra-pro-

fessional pharmacists who would dissent from this assumption. One professional pharmacist recently made this remark to the writer: "Patents are evils—mostly unnecessary; they deceive buyer, seller, and usually the patient—why not ignore them? At least, do not let ourselves be drawn into any consideration of them that can be profitably avoided." With this assertion doubtless the average physician will agree. The physician if not the loud objector nevertheless winces at the thought of his field being lessened by the dispensing of an unknown drug combination, the value of which depends upon the favorable psychology which advertising produces. It goes without saying that these products are just as good after the psychological boost is withdrawn as before, but from a business point of view they are comparatively dead stock. This psychological fact should require no special call for instruction in a pharmaceutical curriculum.

At first thought the suggestion above mentioned seems reasonable and, no doubt, the information received would be of a great deal of practical interest to the young student who is seeking to master the details of the ultra-practical side of his profession, yet on second thought we are struck with the inconsistencies which will inevitably result if we admit the teaching of "patent drugs" into our curriculum, and exclude a score of other quite as worthy subjects, from the viewpoint of certain pharmacists at least.

The retail drug store of to-day is a most curious medley. We may well affirm, without fear of serious contradiction, that every druggist in the United States carries at least some one of thousands of merchantable items manufactured in this country at the present time. Our list must include machinery, dry goods, clothing, groceries, bicycles, photographic supplies, radio outfits, phonographs, as well as others. The truth is that the pharmacist sells practically everything that is to be sold and "patents" are by no means the most important package lines which many druggists handle. Commercially, no school of pharmacy can ever hope to acquaint its students with the many important ramifications of the retail drug business. When it comes to the choosing of package medicines rather than one of fifty other important side-lines I am reminded of Browning's words:—

"Now who shall arbitrate?
Ten men love what I hate,
Shun what I follow, slight what I receive,
Ten who in ears and eyes
Match me: we all surmise,
They this thing and I that:
Whom shall my soul believe?"

To repeat: when we step outside of the narrow confines of strictly professional pharmacy we are at once confronted with the dilemma as to what to include and what not to include. From a professional point of view pharmacy concerns itself with the preparation and compounding of drugs, with the direction of the strength and purity of these drugs and medicaments. Whatever functions aside from these are added do not connect up intimately with legitimate pharmacy. It is for the above reasons that the pharmacist enjoys a professional title and monopoly from the state. The state assumes that the pharmacist has exercised certain knowledge of the compounds and preparations which he dispenses. The state presupposes this intimate knowledge as belonging to his professional equipment.

So far as knowing the ingredients of the materials he sells is concerned, a pharmacist is no wiser in selling a patent medicine than he is in selling a piece of machinery, the mechanism of which he has not been permitted to see and the directions of which he has merely to take on faith. If the college of pharmacy is to include in its curriculum the mere enumeration of thousands of names of patented articles for no other purpose than to teach the student that such articles exist, the school of pharmacy must likewise concern itself with instructions in all of the so-called pharmaceutical side-lines. Indeed it would be far more proper to include a course in the mixing of soda water, the preparation of ham and egg sandwiches, the recital of the catalogs of Victor talking machines and a score of other important matters that might likewise be included in pharmaceutical general knowledge. So long as patent medicine is but a name of a mixture for this and that disease, it matters little how meritorious that mixture may be, and there can be no room for its inclusion in the school of pharmacy where emphasis must be put entirely on teaching those subjects that are concerned only with the professional aspects and for which the state recognizes and protects the pharmacist and gives him a monopoly to ply his trade.

When all is said and done concerning the question of teaching "patents" in the curriculum of our schools of pharmacy, we must fall back on one point previously mentioned which is fundamental to any consideration of this subject. When the state creates, upholds and legalizes the profession of pharmacy and gives to the pharmacist certain rights not enjoyed by other men, it assumes that a certain knowledge and training are given to the young men and women who enter the ranks of this calling. The function of our schools of pharmacy must, therefore, be primarily to impart basic professional information. Unless we are ready to admit, and few of us can, that the professional content of pharmacy is exhausted, digested and mastered, so to speak, in the regular undergraduate two-, three- and four-year courses, we cannot uphold the inclusion of any seemingly extraneous material. This does not mean, however, that the student should not be made familiar with the various institutions and interests contributory to the vocation of pharmacy, such as the manufacturers' association, the proprietors' association, their codes of ethics and their spheres of activity.

The present curriculum, as usually carried out in our leading schools of pharmacy, contains sufficient information concerning "Commercial Pharmacy" to make all of these points clear and to give the student the psychological outlook which he must have when he enters his vocation.

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All articles appearing in these lists will be presented in abstract form in the bound volumes of the YEAR BOOK which will be issued as soon after the end of the year represented as editing and printing conditions permit. Those desiring abstracts immediately can obtain same for a fee of one dollar each by communicating with H. V. Arny, 115 West 68th St., New York, and arrangements can also be made for securing photographic reproductions of entire articles at moderate prices when such are desired.

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Z. physiol. Chem.; through *J. Soc. Chem. Ind.*, 41 (Mch. 31, 1922), 228A

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Chem. Weekbl.; through *J. Soc. Chem. Ind.*, 41 (Mch. 15, 1922), 188A

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Oesterr. Chem. Ztg.; through *J. Soc. Chem. Ind.*, 41 (Mch. 15, 1922), 188A

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Z. Hyg. Infect.-Krankh.; through *J. Soc. Chem. Ind.*, 41 (Mch. 15, 1922), 193A

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J. Am. Med. Assoc.; through J. Am. Pharm. Assoc., 11 (Apr. 1922), 275

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J. pharm. chim., 25 (Jan. 16, 1922), 49

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Chem. & Drug., 96 (Mch. 11, 1922), 324

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Compt. rend.; through *J. pharm. chim.*, 25 (Mch. 1, 1922), 192

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J. Ind. Eng. Chem., 14 (Apr. 1922), 269

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Z. Unters. Nahr.-Genussm.; through *Pharm. Ztg.*, 67 (Feb. 22, 1922), 156

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Chem. Umschau; through *Pharm. Zent.*, 63 (Mch. 15, 1922), 153

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J. Biol. Chem.; through *J. pharm. chim.*, 25 (Mch. 16, 1922), 230

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Ber.; through *J. pharm. chim.*, 25 (Mch. 1, 1922), 183

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Pharm. Zent., 63 (Mch. 30, 1922), 180

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Pharm. Era, 55 (Apr. 1922), 135

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Hydrolytic action of emulsin
Z. physiol. Chem.; through *J. Soc. Chem. Ind.*, 41 (Mch. 31, 1922), 228A

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J. Soc. Chem. Ind., 41 (Mch. 31, 1922), 230A

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Lancet.; through *Am. Drug.*, 70 (Apr. 1922), 16

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Arch. Kinderheil.; through *Am. Drug.*, 70 (Mch. 1922), 40

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J. pharm. chim., 25 (Feb. 1, 1922), 99

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Compt. rend. soc. biol.; through *J. pharm. chim.*, 25 (Mch. 16, 1922), 228

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The Folin assay of uric acid
J. pharm. chim., 25 (Feb. 1, 1922), 87

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J. pharm. chim., 25 (Mch. 16, 1922), 209

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Pharm. Weekblad, 59 (Mch. 11, 1922), 234
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J. Am. Med. Assoc.; through *Am. J. Pharm.*, 94 (Apr. 1922), 295

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Chem. Umschau; through *Pharm. Zent.*, 63 (Mch. 23, 1922), 171
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D. A. Apoth. Ztg., 43 (Mch. 1922), 4
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Bull. Pharm., 36 (Apr. 1922), 152
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J. Soc. Chem. Ind., 41 (Mch. 15, 1922), 92R
Sayre, L. E.
Beverages and fruit flavors
Am. Drug., 70 (Mar. 1922), 24

PROCEEDINGS OF THE LOCAL BRANCHES

"All papers presented to the Association and its branches shall become the property of the Association, with the understanding that they are not to be published in any other publication than those of the Association, except by consent of the Committee on Publication."—By-Laws. Chapter X, Art. III.

Reports of the meetings of the Local Branches should be mailed to the Editor on the day following the meeting, if possible. Minutes should be typewritten, with wide spaces between the lines. Care should be taken to give proper names correctly, and manuscript should be signed by the reporter. To maintain its activity and representation each Branch should see that at least three of its meetings during the year are reported in the JOURNAL.

BALTIMORE.

The March meeting of the Baltimore Branch of the American Pharmaceutical Association was held at the Emerson Hotel on March 22, 1922.

Dr. Hermann Engelhardt, the newly elected President of the Branch, in his opening remarks greeted the Branch as their leader for the ensuing year. There was a good attendance.

Dr. E. F. Kelly, as chairman of the Committee on Legislation and Education, explained the splendid progress of the bills in the Maryland Legislature dealing with the positions of the pharmacists and the State Board of Health. Emphasis was laid on the most unusual coöperation of the pharmacists in the state in supporting these measures.

The main feature of the evening was an address by Dr. Neil E. Gordon, head of the Department of Chemistry of the University of Maryland. The title of the address was "Emulsification and Absorption." The speaker made clear the theory of emulsification from the standpoint of the physical chemist and colloidist, and laid particular stress on the three phases of the usual pharmaceutical emulsions. The permanency of emulsions was discussed at great length, and slides were used to illustrate the stability of emulsions made with various emulsifying agents. At this point the lecturer introduced Fisher's so-called "Hydrate Theory" of emulsification, which holds that the soluble phase of the three phase emulsion forms with water a large hydrate, thus modifying the properties of the water to the extent of more or less permanently suspending the insoluble phase. The "Hydrate Theory" explains that the breaking of emulsions by the addition of saline solutions is due to the neutralization of the charge on the hydrate by the electrolyte.

Under "Absorption" Dr. Gordon discussed some of the research work in which he was engaged, establishing a ration between the hydrogen ion concentration of absorption of many substances, including iron, aluminum and silica jells.

Following the lecture an exceedingly interesting discussion took place, in which H. H.

Crosbie, chemist with Messrs. Sharp & Dohme, criticized the theory of emulsions of the colloidists and stated very emphatically that the physical chemist had derived his theory from the long established pharmaceutical idea of emulsions. After this lengthy discussion, it was generally admitted that much valuable information had been gained by all.

A letter from the secretary of the Washington Branch, accepting the invitation of the Baltimore Branch. for a joint meeting on April 26th, was read.

B. OLIVE COLE, *Secretary-Treasurer.*

CHICAGO.

The 126th meeting of the Chicago Branch of the American Pharmaceutical Association was held at the University of Illinois School of Pharmacy Building, Friday evening, April 7, with President C. M. Snow in the Chair, and a good attendance of members and friends.

President Snow introduced the speaker of the evening, City Chemist A. E. Anderson of Moline, Ill., a graduate of the U. of I. School of Pharmacy (1911) and formerly a pharmacist of Moline, who presented an illustrated lecture on the "Purification of the Water Supply of Moline."

The lecture was of great interest not only from a scientific standpoint but from the standpoint of the accomplishments of a pharmacist still deeply interested in the great pharmaceutical problems of our day. The description of the water plant, and of the Mississippi River at this point from which the water is obtained, introduced the lecture. The methods by which the very turbid water of the river, frequently containing large numbers of bacteria, are purified by alum precipitation, filtration through the alum "flock," sand and gravel, and chlorination with free chlorine, were also very clearly presented with many excellent pictures illustrating the same.

The chemical and bacteriological laboratories proved of greatest attraction to most of the audience. While the methods of water and milk examination used are the standard ones, every method is kept right up to date and no means spared in providing the best facilities for good work. A complete series of bacteriological tests of the raw and the treated water is run every day as well as determinations of the turbidity and color. The turbidity is estimated on the basis of one gram of fuller's earth mixed with one liter of distilled water having a valuation of 1,000. By dilutions of this standard to the same degree of turbidity as the water exhibits it is possible to give a value to the turbidity of the water. While the turbidity of the raw water at Moline may sometimes reach as high as 800, its average is about 125. The turbidity of the treated water seldom reaches 10 and is frequently at zero. The color of the raw water is also frequently very high but the color is usually reduced to almost nil. The bacterial count in the raw water has reached as high as 138,000 per cc though it usually is much below this, but in the treated water very seldom exceeds 10 per cc.

Of great interest, also, were the charts and tables indicating the degree of purification and comparing the city water supply at present with what it had been in previous years. The Typhoid Fever Mortality Chart indicated a decrease in the death rate from 151 per 100,000 to none.

A number of questions were asked from the audience and an extended discussion followed the address. Particular reference was made to the remarkable achievements of preventive medicine and the part that pharmacists and chemists were taking in this work.

The May meeting of the Branch will compare the progress of U. S. P. and N. F. revisions, with several short papers on certain drugs and processes.

E. N. GATHERCOAL, *Secretary.*

CINCINNATI.

The March meeting of the Cincinnati Branch, American Pharmaceutical Association, was held at the Lloyd Library, March 31, and was devoted mainly to a discussion and demonstration of the "One Hour Frog Test" for the standardization of digitalis.

Miss Elizabeth Gates and Miss Louise Lilly of the Control Laboratory of the Wm. S. Merrell Co. gave a demonstration of the pharmacopoeial method for physiologically testing digitalis leaves on frogs. Miss Gates, who described the method as the demonstration was made, explained the requirements of the Pharmacopoeia, namely, that the frogs should be kept in running water at a uniform temperature, not above 15 degrees; that their resistance should be tested by crystallized ouabain, and that the frogs used must be in a healthy condition, and in order to make the end results comparable must be of the same species, and must be of a fairly uniform size, preferably weighing between 15 and 20 grams. The frogs used in this case were the com-

mon grass frogs, *Rana Viridis*. (Part of the explanation is reported.)

Exactly one hour before the demonstration, each frog to be operated on was administered a dose of the digitalis preparation under examination, in this case the fluidextract, which was carefully calculated to the weight of the particular frog. As a rule four frogs of practically uniform weight are taken for one determination, and the dose per gram of body weight varied from 0.0002 to 0.001 of a cubic centimeter with each of the four frogs. The liquid preparation is first so diluted that the quantity injected in each case is approximately uniform, and in no case more than 0.015 cc of liquid for each gram of body weight of frog. In no case must the liquid contain more than 20% of alcohol. If the preparation under examination contains a larger proportion of alcohol, part of this can be driven off at a low temperature, and the dose made up by the addition of an aqueous normal salt (0.7% NaCl) solution.

The dose is carefully measured by means of a finely graduated pipette. In practice, Miss Gates explained, it is preferable to use a hypodermic syringe for the injection rather than the pipette directed by the Pharmacopoeia (p. 54), as even with this some skill is required to insure the injection of the dose without any loss. At the end of one hour the frog is pithed. If the doses have been properly graduated, it will be found that the exposed heart of one or two of the frogs will have stopped in one hour in systole, with the auricle widely dilated and the ventricle contracted. No general contraction, or only a very feeble one, should follow mechanical stimulation of the heart, though slight contractions in the auricle and ventricle do not vitiate the end results.

This trial assay will show the approximate strength of the preparation. A second series of frogs is then injected in the same manner, but with much narrower dose limits between the different subjects. In some cases it may be necessary to make as many as three or four sets of examinations, in order to arrive at positive determination of the required dose.

In view of the fact that there is a considerable difference in the susceptibility of different frogs, the frogs are first standardized by the administration of solution of ouabain, the standard dose of which is 0.0000005 gram per gram of body weight of frog. The standard dose of official tincture digitalis to correspond with this is 0.006 gram per body weight of frog.

If in the application of this test it is found that a particular lot of frogs are unusually resistant to ouabain, so that a dose of 0.00000075 gram is necessary to stop the heart in systole after one hour, the dose of tincture digitalis would have to be increased approximately to 0.009 cc. Put into the form of a statement in proportion, this would read:

Standard dose of ouabain	: Found dose of ouabain	: Standard dose of drug being assayed
	Necessary dose of unknown	

In the discussion that followed Miss Gates explained a number of details which must be observed in order to get a concordant result, but when these details are observed the results are so accurate as to give a very reliable index of the toxicity of the drug under examination.

She pointed out, however, that while this was the only standard for determining the strength of digitalis provided for in the Pharmacopoeia, it did not follow that this was the correct standard from a clinical standpoint, for an examination was made in the Merrell Laboratories of digitalis tincture prepared from a sample which had been divided into two parts when first collected. This examination showed that the tincture made from the dry drug was twice as toxic as that made from the same lot of drug which was put into alcohol as soon as collected without drying and made up into the "Green drug tincture," though this green leaf tincture gave better clinical results than did that made from the dry leaf.

It is a matter of regret that so far no adequate clinical or cardiographic determination had been made of the relative therapeutic value of the preparation made from the fresh drug, and that made from the dry drug.

Miss Gates and Miss Lilly were given a rising vote of thanks by the members of the Branch, all of whom were greatly interested in the subject.

Dr. Caswell Mayo briefly summarized the history of hydrogenated oils, outlining the possibilities of the use of hydrogenated oils in pharmacy and showing some samples of Zinc Oxide Ointment, made from crisco—a hydrogenated cottonseed oil.

The great advantage which these hydrogenated oils possess over lard is that they keep

indefinitely. One sample of Zinc Oxide Ointment, made from hydrogenated cocoanut oil, was shown which had been made seven years ago, and was still unchanged. Sample was also shown in which the introduction of hard paraffin as a means of making a stiffer ointment had resulted in crystallization of the product.

The speaker stated he had received a note from Dr. Jacob Diner, chairman of the Committee on Ointments of the Committee of Revision of the Pharmacopoeia, who informed him that while the use of hydrogenated oils for pharmacopoeial ointments had been discussed, these oils had not been adopted.

Dr. Mayo also brought to the attention of the members the fact that the U. S. Commissioner of Internal Revenue had under advisement a plan for the issuance of permits to use tax-free premedicated or special denatured alcohol in the manufacture of medicines for internal use. This had been objected to by a pharmaceutical conference held in Washington, and also at a meeting of pharmacists held in Philadelphia. Resolutions opposing it had also been adopted by the Cincinnati Academy of Medicine, and he suggested that a committee be appointed to draw up resolutions giving the views on the subject and forward them to the Secretary of the U. S. Treasury. The suggestion was adopted and a committee was appointed, consisting of D. E. Murphy, Fred Kisker, Chas. A. Apmeyer, Louis Werner, to draw up the Resolutions, after conference with Chairman Frank Freericks, of the Committee on Legislation.

CHAS. A. APMEYER, *Secretary.*

DETROIT.

The Detroit Branch of A. Ph. A. met April 14, 1922; President Washburne presided. The reading of the minutes of the previous meeting was dispensed with, due to the extended program of the evening. The members of the Detroit Retail Druggists' Association had been invited, so that a large enthusiastic audience was on hand to enjoy the program.

The president announced the annual election of officers to be held May 12, 1922, on the occasion of the last regular meeting of the year 1921–1922. He appointed Messrs. Scoville, Mann and Webster to serve as a Nominating Committee.

Mr. Drugociu was introduced as the first speaker of the evening to give a talk on "Pharmacy in Roumania." He explained the difference between a drug store and a pharmacy as they are known in that country. The fact that pharmacists are protected and, in a sense, subsidized by that government explains also why the pharmaceutical profession of Roumania is so highly respected and so well rewarded for their labors. He promised to discuss a comparison of American and Roumanian practices in pharmacy at some later date. At the conclusion of his talk he was plied with questions concerning the extent of government regulation of the profession and other points which arose during it. The discussion was led by Messrs. Schettler, Hall, Seltzer and Webster.

President Washburne then introduced Prof. Charles H. Stocking, Secretary of the Department of Pharmacy of the University of Michigan, who read a paper on the subject "A History of the Department of Pharmacy of the University of Michigan," which traced the development and vicissitudes of that department since its inception, in the year 1868, to the present time.

Charles Smith, who was scheduled to address the meeting on developments in "Wholesale Pharmacy," enlarged the scope of his talk by relating some stories and anecdotes concerning his earlier career in retail pharmacy. Upon request of Mr. Smith, all present rose for a few seconds in honor of those who had blazed the trail in our profession, and whose names had been mentioned frequently by all the speakers.

The next paper was by Ernest Kimmich, who chose "Manufacturing Pharmacy" as his subject. He dealt with his experiences, problems and impressions while the business grew from a small shop to a plant covering many acres.

Wilbur L. Scoville followed with a talk on "Reminiscences of My Education in Pharmacy." He spoke of the limited curriculum which existed at the college of pharmacy in his youth and the typical tricks perpetrated by the students on various members of its faculty.

The concluding features of the evening were talks given by Messrs. Mann, Schettler and Rohnert. Their reminiscences caused much merriment, as they told of the times when pharmacy was young in this city. They presented also serious facts concerning the practices and struggles within the profession during the eighties and nineties. The changes and improvements in retail pharmacy were reviewed by each speaker as his memory furnished them. All three visioned a brighter future for legitimate pharmacy.

Mr. Crandall, chairman of the Program Committee, announced the annual election of officers for the last regular meeting of the year, May 12, 1922. In addition, Mr. Leonard A. Seltzer is on the program for a talk on "The Revision of the U. S. Pharmacopoeia," while Mr. Gorenflo, member of the Michigan State Board of Pharmacy, will stage a "Prescription Clinic."

Messrs. Charles Smith and C. F. Mann contributed further to the history of pharmacy in Detroit in relation to Dr. A. B. Stevens and others who had once occupied a prominent place in local pharmaceutical circles.

EDWARD K. FIELD, *Secretary.*

INDIANAPOLIS.

The March meeting of the Indianapolis Branch of the American Pharmaceutical Association was held in the Chamber of Commerce, Indianapolis, March 21st.

A stereopticon lecture was given by Dr. Homer W. Smith, formerly with the Hygienic Laboratory at Washington, now in the Research Department of Eli Lilly & Company. Dr. Smith's subject was: "The Dynamics of Arsenic Therapy."

The use of arsenic in the form of the sulphide as an outside remedy for ulcers, etc., dates back to Hippocrates. Dschabir, in the eighth century, was the first to roast the sulphide and obtain white arsenic (As_2O_3). In the fifteenth, sixteenth and seventeenth centuries white arsenic was extensively used by professional poisoners, it being the only commonly known poison which could not be detected by taste, smell or color. The first therapeutic preparation of arsenic was Fowler's solution, introduced in 1786 by a London physician of that name, as an ethical reproduction of a secret and popular nostrum called "Tasteless Ague and Fever Drops."

Practically all the organic compounds of arsenic, following Cadet's discovery of cacodyl, are synthetic. The first aromatic arsenical was atoxyl, a by-product in the manufacture of the dye magenta. The constitution of atoxyl was demonstrated by Ehrlich and Bertheim in 1907, and many other aromatic arsenicals were synthesized by Ehrlich and his co-workers and their therapeutic powers tested on animals infected with protozoal diseases. Arsphenamine was completed in 1910, and neoarsphenamine in 1912. Subsequent investigations of the therapeutic activity of various arsenicals have shown that Ehrlich's interpretations of their modus operandi is erroneous: the keynote to the biochemical properties of arsenic lies in the fact that it only exerts a direct toxic action on living protoplasm when it is in the trivalent-oxide state. In the more highly reduced arseno state, and in the oxidized or pentavalent state, arsenic is not toxic for any form of life. (These relations are equally true for antimony.) The pharmacological properties of various arsenic and antimony compounds can be very largely explained by a consideration of the ease or rapidity with which oxidation or reduction of any particular compound takes place. These same factors determine in large measure the ratio between the minimum lethal dose and the minimum therapeutic dose. This ratio is greatest in the case of the arseno compounds, arsphenamine and neoarsphenamine, which are not directly active but which are readily oxidized to the corresponding toxic and parasitocidal oxides. Because of the ease with which these substances are oxidized, it is necessary to prepare solutions of arsphenamine and neoarsphenamine with great care, to prevent increased toxicity or even loss of therapeutic activity.

The annual election of officers was then held; this was reported in the April JOURNAL A. PH. A.

ERNST STAHLHUTH, *Secretary.*

NORTHWESTERN.

The officers of the Northwestern Branch contributed toward the joint meeting of the Minnesota State Pharmaceutical Association. The Scientific Section and the Section of the Branch held a very profitable joint meeting on February 16th, devoting the entire day from 9:30 in the morning until 6 o'clock in the evening. The audience at times, especially in the afternoon, numbered over four hundred. The proceedings of the joint meeting will be published as a part of the 1922 Proceedings of the M. S. P. A. A number of the papers will be printed in the JOURNAL A. PH. A.

Reported by DEAN FREDERICK J. WULLING.

PHILADELPHIA.

At the March meeting, held at the Phila. College of Pharmacy and Science, Tuesday, March 14th, Dr. Robert C. White was introduced by President England as the speaker of the evening. His subject was "The Coating of Compressed Tablets." Various methods of coating and polishing were outlined and illustrated. Formulas for the different coatings were given and the necessity of varying these formulas, according to the composition

of the tablets, was discussed. Dr. White's address was well received and a vote of thanks was tendered to him.

Reports of the committees appointed at the last meeting were then presented. A. B. Nichols, chairman of the auditing committee, reported that the books of the secretary and treasurer had been examined and found correct. The committee expressed appreciation on finding such a satisfactory balance in the treasury.

The nominating committe made its report through Chairman E. Fullerton Cook. The nominees for 1922-23 were elected, and are as follows:

President—Wm. H. Jenkins, a graduate of University of Iowa College of Pharmacy in '95. He engaged in the retail drug business until 1900 when he joined the U. S. Custom House Service; in 1917 he became attached to the field force of the Department of Agriculture. In 1920, he went with H. K. Mulford Co., as manager of the "Fluid Department."

First Vice-President—Dr. Horace B. Morse, of Temple University. Dr. Morse has been granted leave of absence by the university, for special studies.

Second Vice-President—Wm. R. Decker, a retail pharmacist since 1901, and is active in all the local and national organizations.

Secretary-Treasurer—Jos. W. E. Harrisson, Assistant Chemist, Bureau Foods, Pennsylvania Department of Agriculture.

Fraternal Relations Committee: Chairman—Frank E. Morgan, a retail pharmacist since 1881; Dr. Horatio C. Wood, Jr., well known author and member U. S. P. Revision Committee; Joseph W. Noble, president of the Philadelphia Retail Druggists' Association.

Membership Committee: Chairman—Ralph R. Foran, of the Technical Chemistry Department, P. C. P. and S.; J. C. Peacock, president, Pennsylvania Pharmaceutical Association, and Leo G. Penn, retail pharmacist and member of Temple University teaching staff.

Practical Pharmacy Committee: Chairman—Robert C. White, graduate of the University of Maryland, 1903; formerly connected with Temple University, now president of the Robert C. White Co., Inc.; John K. Thum, apothecary at Lankenau Hospital, and Robert Simpson, retail pharmacist.

Council Member: Dr. Frank E. Stewart.

The new officers of the Branch were installed. President England expressed his appreciation of the coöperation he had received during the year from the members.

Jos. W. E. Harrisson, *Secretary.*

Correspondence

IRREGULARITIES IN THE CONDUCT OF EXAMINATIONS IN ILLINOIS.

The exposé in Illinois regarding irregularities in the conduct of state examinations for licensure of pharmacists, physicians, dentists and "other practitioners," as described in the daily press, notably in the *Chicago Daily Tribune*, is another argument against a system—consolidation of boards—which gives opportunity for the protection of dishonest practices.

While the whole story cannot be told until the State's Attorney's office has had ample opportunity to present its case to the Grand Jury, I feel it my duty, as Secretary of the National Association of Boards of Pharmacy, to give to the pharmaceutical press a statement of the facts, so far as they may be divulged at this time.

A few of the high points should be set forth at the very beginning:

First: To the credit of pharmacy and pharmacists, let me say that the Pharmacy Examiners themselves in this state are not accused of being responsible for, or of knowingly aiding in, the disgraceful proceedings, although they had begun to suspect that all was not well.

Second: The pharmacy examinations, it now develops, had but a minor part in the plot; medicine, nursing, veterinary medicine, dentistry, chiropractic, osteopathy, etc., etc., were all involved—the "big killings" appear to have been made in medicine.

Third: The irregularities consisted, so it appears at this writing, in supplying advance copies of the state board questions to individuals conducting certain "Quiz" schools who either sold them to their students direct or "fed" them to the students in short review courses of a week or ten days preceding examination. The fees charged ranged from $200.00 to $500.00. Lists of names of men who had failed in examination were supplied to these schools and a high-pressure

advertising system was employed in getting them to come in. All the old tactics were used—circular letters every other day: "hurry, hurry, our classes are nearly full"—"you have but two days more"—"it will pay you to see me personally"—etc., etc.

In addition, persons who were not eligible to take the examination because of lack of experience, college graduation, etc., had their admission credits "fixed up" so they could take examination; the prices paid ranging from $500.00 to $2500.00 for the privilege of taking the medical examination, this in addition to the fee paid (usually $200.00) for entrance to the quiz course. It is reported that two osteopath practitioners, a man and a woman, paid $1100.00 and $2500.00, respectively, for the privilege of taking the medical examination, which, of course, they passed. Cases are also reported where candidates, after receiving notice of failure in examination, would be visited by a "fixer" and, if the sum demanded was paid, a license would come in due time, but the names of such persons would not be included in the list of successful candidates issued by the Department of Registration and Education for publication.

The wholesale corruption thus exposed, or about to be exposed, is made possible by the consolidation plan in force here in Illinois, which places all examinations for licensure under one head. States contemplating consolidation of Examining Boards or commissions under a central body, department or bureau, whether similar to the Illinois plan or a modification thereof, would do well to inform themselves as to how this plan actually works out.

The writer has given careful study to the proposition, not only from the viewpoint of the Illinois plan, but from every conceivable angle of the many modifications of this plan which have been proposed from time to time, and always arrives at the same conclusion, *viz.*, that the prevailing custom of changing heads of departments or bureaus when political rule changes in a state makes it impossible to guard against the probability of a condition such as exists in Illinois at present.

The consolidation of all examining boards, especially the professions, under one executive head, places in the hands of one man tremendous power, responsibility and temptation. If he is the kind of man to be tempted, the power granted him under the law, together with opportunity to usurp additional power in conducting examinations for licensure in the various professions, gives very great possibilities for loot. Under a broad-gauge executive—a man of vision and integrity—if such a man remained permanently without being subject to removal under changes of political administration, consolidation of boards, properly safeguarded, if that were possible, might be tolerated. Under a "narrow-gauge" politician, who knows no ethics, and who looks upon his office only as a source of personal gain, the possibilities for harm are unlimited. In the changes of personnel incidental to changing administrations, the wrong man will land in office sooner or later and then we have chaos. The safety of the state in this branch of its government would therefore, it appears from experiences we have had, be better protected by having each separate board control its profession.

Having described rather sketchily the major points in the situation, it may not be amiss to describe briefly how the conditions "broke cover" and who seems to be responsible.

In the October 1921 Illinois pharmacy examination—on which examination the writer was one of the examiners—only two of the four sets of questions to be used were sent to the Department of Registration and Education to be printed, as ordered. Two sets were withheld because suspicion had been aroused. In that examination it was discovered, when the answer papers were rated, that several candidates had made unusually high marks on the subjects which had been printed by the department, and notoriously low grades on the subjects printed by the examiners themselves and which were brought in on the morning of the examination. Coupled with this was a "request" from the Director—the head of the department—presented by one of the examiners, that these same men be "put over."

My connection with the department as an examiner was forthwith severed, as was also that of Mr. Frank W. Kraemer of Chicago, a member of the Board up to that time.

Rumors concerning conditions continued to come in, "short course" schools offering five to ten day courses sprung up over night, in spite of the fact that for the past fifteen years one "short course" school has been ample to take care of applicants for review work—this a high-grade institution with excellent instructors, charging a very moderate fee and making no pretense of "guaranteeing" results. The new schools charged fees of $200.00 and upward for a few days'

course and guaranteed that the student would pass. Candidates who had failed on examination repeatedly, some of them even failing to obtain assistant registration, suddenly appeared with registered pharmacist certificates. Circumstantial evidence was mighty convincing.

I recognized, as did others, that the condition which had sprung up was a public menace—a plague abroad in the land. I also realized that when conditions in any state reach such a pass that applicants unqualified to take or unable to pass an examination can be "put through," such a condition, in addition to being a menace to public health, will, if permitted to continue, undermine the principles on which reciprocity is founded.

About March first, I consulted the Attorney General's office and by agreement with him the matter was placed in the hands of the Cook County State's Attorney, with such evidence as I had collected. Men under suspicion were brought in and questioned. Some of them confessed. The Chicago *Tribune* gave due publicity to the hearings and aided materially in securing important evidence. As soon as it became known that the situation was being unearthed, information poured in. The State's Attorney's office now has plenty of evidence for their purpose and more is coming in every day. We expect to go before the April Grand Jury to secure indictments, and then to trial.

It appears that the central figure in the scandal had surrounded himself with relatives and confidants, both inside and outside of his office, and, evidently, thought himself sufficiently intrenched so that it would be impossible to implicate him.

There is much interesting matter to be told, but it must be withheld until the legal requirements are satisfied.

In conclusion, it may be added that the "conspiracy" was of short duration. Illinois is righting itself; 99.9% of our pharmacists are honest, reputable men. Right will prevail here as elsewhere in the long run. Any harm done will be corrected so far as is humanly possible.

The officers of the National Association of Boards of Pharmacy came to the support of their secretary at once with letters and telegrams offering both financial and moral support. This support is having a healthy and far-reaching effect on the situation.

In the foregoing I have only alluded to the conditions in this state which make our present undesirable situation possible. In a later article, when we have cleaned up our present muddle, this office will send out a survey of the whole situation, analyzing, so far as possible, fundamental principles, in the hope that it may be of value to states planning changes in their administrative code.

LATER.

Since the foregoing was written, the regular Cook County (Illinois) Grand Jury voted true bills—indictments—charging conspiracy, graft, etc., against the following named persons:

W. H. H. Miller, Director of the Department of Registration and Education.

Dr. Odeon Bourque, Dean of the Chicago Medical College, and head of the National Review System.

K. A. Fries, son-in-law of W. H. H. Miller, a clerk in the department, in charge of educational qualifications of applicants for examination, and having various other duties giving him access to examinations and examination records.

William S. Bromarczyk, a druggist reported to have failed in examination but to have received a license.

It is expected that several other indictments will follow, and that early trial dates will be fixed.

H. C. CHRISTENSEN, Secretary National Association of Boards of Pharmacy.

COUNCIL BUSINESS

A. PH. A. COUNCIL LETTER NO. 11.

WASHINGTON, D. C., April 3, 1922.

To the Members of the Council:

63. Mr. Clyde L. Eddy has been elected Secretary of the Section on Historical Pharmacy.

64. Applicants Nos. 194–213 elected to active membership.

65. Francis E. Bibbins has been elected Council Representative from Indianapolis Branch, to succeed Frank R. Eldred.

66. Election of active members: No. 214,

Sister Mary Gabriel Conerton, Carney Hospital, Old Harbor St., Boston, Mass.; No. 215, John Thomas Murphy, 27 Prospect St., Somerville, Mass.; No. 216, Joseph Godsoe, Mass. General Hospital, Boston, Mass.; No. 217, Sister M. Benedicta Kuyven, 2800 Main St., Kansas City, Mo.; No. 218, Frederick Kenney, 125 Worth Street, New York, N. Y.; No. 219, Augustine B. Bovles, State Hospital, Middletown, Conn.; No. 220, Mary R. Hamilton, 500 Pinney St., Rochester, Pa.; No. 221, George Arnold Burbidge, Maritime College of Pharmacy, Halifax, Nova Scotia; No. 222, George Wiberg, 683 Ashburn St., Winnipeg, Manitoba, Canada; No. 223, Edward Klar, 410 East 78th St., New York, N. Y.; No. 224, Christopher H. Mahan, 27 Belmont Ave., Jersey City, N. J.; No. 225, Leopold Lowenstein, 609 W. 115th St., New York, N. Y.; No. 226, Byron W. Swift, 425 South Division St., Ann Arbor, Mich.; No. 227, Harley Wesley Rhodehamel, 3323 College Ave., Indianapolis, Ind.; No. 228, Joseph Caruso, 70 Wilson Ave., Brooklyn, N. Y.; No. 229, John P. Sweeney, 814 East 54th St., Chicago, Ill.; No. 230, Sister Mary Rose, 3409 Woodland Ave., Cleveland, Ohio; No. 231, M. Margaretta Hodge, Presbyterian Hospital, Pittsburgh, Pa.; No. 232, William James Danforth, 120 West Markham St., Little Rock, Ark.; No. 233, Stephen L. Demeter, 2816 Pearl Ave., Lorain, Ohio.

A. G. DuMez, *Secretary.*

A. PH. A. COUNCIL LETTER NO. 12.

(Abstract.)

Washington, D. C., April 21, 1922.

67. Applicants Nos. 214–233 elected to active membership.

68. Motion to present to the Hygienic Institute of Prague, Czechoslovakia, a set of the Proceedings and Year Books of the Association. Under date of April 5, 1922, Secretary Day writes from Chicago as follows:

"Dr. Edward Kremers of the University of Wisconsin has written to me under date of April 3d, stating that he has received word from Professor Thoms of Berlin that the 53 volumes of Proceedings and 8 volumes of the Year Book presented to the Pharmaceutical Institute of the University of Berlin have been received.

"Dr. Kremers now suggests that the Association present to the Hygienic Institute of Prague, Czechoslovakia, a similar set of our Proceedings and Year Books.

"Dr. Kremers has recently had a visit from Dr. Z. F. Klan, a government representative of the new republic of Czechoslovakia and one of the Rockefeller Foundation Fellows of the Hygienic Institute of Prague. Dr. Klan after his return to Czechoslovakia is to have charge of food and drug inspection in that country.

"Dr. Kremers now writes:

"'I trust that this suggestion will meet with the approval of the Council. I know of no better use that we could make of our surplus copies. Science should know neither country nor creed. Incidentally science may assist in healing a few of the wounds produced through militarism, by greed, and hatred, which seem to be ruling the world, our own country as well as other countries.' "

It is moved by Day, seconded by DuMez, that this request of Prof. Kremers be granted.

69. Election of active members. No. 234, Albert Earl Gendreau, 2679 E. 75 St., Chicago, Ill.; No. 235, Alfred Milton Kronberger, 144 Court St., Boston, Mass.; No. 236, Russell E. Raymond, 116 17 St., Buffalo, N. Y.; No. 237, Milton Wruble, 221 Belmont Ave., Detroit, Mich.; No. 238, Valerio C. Jaehrling, P. O. Box 278, Manila, Philippine Islands; No. 239, Alda M. Ferris, N. E. Cor. 5th & Market Sts., San Diego, Calif.; No. 240, Harry Peter Quass, 4710 19th Ave. N. E., Seattle, Wash.; No. 241, Homer Merrill Shaw, 5015 8th Ave., N. E., Seattle, Wash.; No. 242, Rudolf Alfred Bissett, 4504 16th Ave., N. E., Seattle, Wash.; No. 243, Peter Cyrel Werba, 4220½ 12th Ave., N. E., Seattle, Wash.; No. 244, Clarence Bernhart Halverson, 4746 18th Ave., N. E., Seattle, Wash.; No. 245, Clenn William Henderson, R. R. No. 2, Box 369, Seattle, Wash.; No. 246, Walter A. Krafft, 3038 Palmer Square, Chicago, Ill.; No. 247, John Kenneth Sullivan, 4746 18th Ave., N. E., Seattle, Wash.; No. 248, Lee Roy Nicholson, 404 N. Anderson St., Ellensburg, Wash.; No. 249, Paul Yuan Cheng, 4339 10th Ave., N. E., Seattle, Wash.; No. 250, Miss Ethel Ava Tschudin, 4514 18th Ave., N. E., Seattle, Wash.; No. 251, Miss Ruby Alice Henderson, 4750 17th Ave., N. E., Seattle, Wash.; No. 252, Dr. Ignacio G. Noble, Doce esquina á 21, Vedado, Habana, Cuba.; No. 253, James S. Davis, 165 N. Wabash Ave., Chicago, Ill.

A. G. DuMez, *Secretary.*

AMERICAN PHARMACEUTICAL ASSOCIATION

Organized: Philadelphia, 1852. Incorporated: Washington, D. C., 1888.

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For list of Council Members see p. 805; for list of Council Committees see p. 806, October 1921.

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Chairman Executive Committee—MRS. LYMAN F. KEBLER ..... Washington, D. C.

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(Appointed by the President.)

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Albert Schneider.....Lincoln, Nebr.
Horatio C. Wood, Jr.....Philadelphia, Pa.

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F. W. Nitardy.....Brooklyn, N. Y.
L. F. Kebler.....Washington, D. C.

5. PHARMACEUTICAL SYLLABUS.

George M. Beringer, 501 Federal St., Camden, N. J.....Term Expires 1922
H. H. Rusby, 776 DeGraw Ave., Newark, N. J.....Term Expires 1923
Willis G. Gregory, 344 Richmond Ave., Buffalo, N. Y.....Term Expires 1924
W. H. Rudder, 3 Lyons Block, Salem, Ind.....Term Expires 1925
E. L. Newcomb, 719 6th Ave., S. E., Minneapolis, Minn.....Term Expires 1926
E. G. Eberle, 253 Bourse Building, Philadelphia, Pa.....Term Expires 1927
E. F. Kelly, Baltimore, Md.....Term Expires 1928

6. PHYSIOLOGICAL TESTING.

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7. REVISION OF CONSTITUTION AND BY-LAWS.

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F. W. Meissner.....LaPorte, Ind.
H. M. Whelpley.....St. Louis, Mo.
G. M. Beringer.....Camden, N. J.
A. G. DuMez.....Washington, D. C.

8. STATUS OF PHARMACISTS IN GOVERNMENT SERVICE.

E. Fullerton Cook, *Chairman*.....Philadelphia, Pa.
Redmond Mayo.....Washington, D. C.
C. C. Cannon.....Washington, D. C.
Robt. P. Fischelis.....New York, N. Y.
C. L. Eddy.....New York, N. Y.

9. UNITED STATES PHARMACOPOEIA.

H. A. B. Dunning, Baltimore, Md.....Term Expires 1922
Hermann Engelhardt, Baltimore, Md.....Term Expires 1923
A. B. Lyons, Detroit, Mich.....Term Expires 1924
William Mittelbach, Boonville, Mo.....Term Expires 1925
Reid Hunt, Boston, Mass.....Term Expires 1926
L. D. Havenhill, Lawrence, Mass.....Term Expires 1927
L. F. Kebler, *Chairman*, Washington, D. C.....Term Expires 1928
E. N. Gathercoal, Chicago, Ill.....Term Expires 1929
E. Fullerton Cook, Philadelphia, Pa.....Term Expires 1930
Arno Viehoever, Washington, D. C.....Term Expires 1931

10. WEIGHTS AND MEASURES.

Jeannot Hostmann, *Chairman*.....New York, N. Y.
H. V. Arny.....New York, N. Y.
H. M. Faser.....University, Miss.
C. M. Snow.....Chicago, Ill.
T. J. Bradley.....Boston, Mass.

11. WILLIAM PROCTER, JR., MEMORIAL FUND.

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A. R. L. Dohme.....New York, N. Y.
B. T. Fairchild.....New York, N. Y.
Caswell A. Mayo.....Cincinnati, Ohio
E. G. Eberle.....Philadelphia, Pa.
J. L. Lengfeld.....San Francisco, Cal.
C. M. Ford.....Los Angeles, Cal.
Clement B. Lowe.....Vineland, N. J.
William B. Day.....Chicago, Ill.
L. E. Sayre.....Lawrence, Kans.
Parker Cook.....Baltimore, Md.
J. K. Lilly.....Indianapolis, Ind.
H. S. Wellcome.....London, Eng.
Chas. G. Merrell.....Cincinnati, Ohio
José P. Alacan.....Havana, Cuba
E. L. Patch.....Stoneham, Mass.
Lewis C. Hopp.....Cleveland, Ohio
James E. Hancock.....Baltimore, Md.

12. TIME AND PLACE OF NEXT MEETING.

Theodore J. Bradley.....Boston, Mass.
R. A. Lyman.....Lincoln, Nebr.
W. F. Rudd.....Richmond, Va.
J. A. Legendre.....New Orleans, La.
W. B. Philip.....Oakland, Calif.

13. BOARD OF CANVASSERS FOR 1922.

H. C. Fuller, *Chairman*.....Washington, D. C.
H. E. Kalusowski.....Washington, D. C.
L. F. Kebler.....Washington, D. C.
Redmond Mayo.....Washington, D. C.
Lewis Flemer.....Washington, D. C.

14. CLOSER AFFILIATION OF PHARMACISTS AND PHYSICIANS.

Bernard Fantus, *Chairman*.....Chicago, Ill.
J. Leon Lascoff.....New York, N. Y.
I. A. Becker.....Chicago, Ill.
H. A. B. Dunning.....Baltimore, Md.

15. LOCAL BRANCHES.

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L. SAALBACH.....Pittsburgh, Pa.
C. W. JOHNSON.....Seattle, Wash.
E. S. THATCHER.....Milwaukee, Wis.
F. E. BIBBINS.....Indianapolis, Ind.
R. W. TERRY.....Cleveland, Ohio
B. H. EICHOLD.....Mobile, Ala.
LEON A. THOMPSON.....Boston, Mass.

16. MODEL PHARMACY LAW.

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H. C. CHRISTENSEN.....Chicago, Ill.
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J. H. BEAL.....Urbana, Ill.

SPECIAL COMMITTEES.

17. AMERICAN JOINT, ON HORTICULTURAL NOMENCLATURE.

H. W. YOUNGKEN, *Chairman*.....Philadelphia, Pa.
E. N. GATHERCOAL.....Chicago, Ill.
F. E. STEWART.....Philadelphia, Pa.

18. COÖPERATIVE PUBLICITY COMMITTEE.

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EDWARD DORSEY.....El Paso, Texas
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W. H. COUSINS.....Dallas, Texas

19. TO COÖPERATE WITH COMMITTEES FROM THE A. C. P. F. AND N. A. B. P. TO OBTAIN PREREQUISITE LEGISLATION.

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C. B. JORDAN.....Lafayette, Ind.
E. F. KELLY.....Baltimore, Md.

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J. H. BEAL.....Urbana, Ill.
JOHN G. GODDING.....Boston, Mass.
C. O. BIGELOW.....New York, N. Y.
WM. B. DAY.....Chicago, Ill.

21. ON A. PH. A. HEADQUARTERS BUILDING.

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JOHN G. GODDING.....Boston, Mass.
LEONARD A SELTZER.....Detroit, Mich.
E. L. NEWCOMB.....Minneapolis, Minn.
CHAS. H. LAWALL.....Philadelphia, Pa.
H. S. NOEL.....Indianapolis, Ind.
WM. B. DAY.....Chicago, Ill.
W. H. ZEIGLER.....Charleston, S. C.
JOSEPH L. LENGFELD.....San Francisco, Calif.
E. F. KELLY.....Baltimore, Md.
H. M. WHELPLEY.....St. Louis, Mo.
GEO. W. MCDUFF.....New Orleans, La.
FRANK H. FREERICKS.....Cincinnati, Ohio
JEANNOT HOSTMANN.....New York, N. Y.

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LUCIEN E. LYONS.....New Orleans, La.

23. NATIONAL DRUG TRADE CONFERENCE.

J. H. BEAL, *Chairman*.....Urbana, Ill.
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24. NATIONAL ASSOCIATION OF RETAIL DRUGGISTS.

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WILHELM BODEMANN.....Chicago, Ill.
W. A. HALL.....Detroit, Mich.
F. W. MEISSNER.....LaPorte, Ind.
E. G. RAEUBER.....Milwaukee, Wis.

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I. A. BECKER.....Chicago, Ill.

26. NATIONAL ASSOCIATION OF BOARDS OF PHARMACY.

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FRED W. ARCHER.....Milton, Mass.
CARLTON B. WHEELER.....Hudson, Mass.
E. G. MCCLALLEN.....Rutland, Vt.

27. AMERICAN CONFERENCE OF PHARMACEUTICAL FACULTIES.

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J. URI LLOYD.....Cincinnati, Ohio
E. H. LAPIERRE.....Cambridge, Mass.

28. CONFERENCE ON NARCOTIC DRUGS.

JEANNOT HOSTMANN, *Chairman*.....New York, N. Y.
E. G. EBERLE.....Philadelphia, Pa.

29. UNITED MEDICINE MANUFACTURERS OF AMERICA.

JOHN C. WALLACE.....New Castle, Pa.

30. ORGANIZATION MEETING OF THE NATIONAL COMMITTEE ON PHARMACEUTICAL RESEARCH.

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E. L. NEWCOMB.....Minneapolis, Minn.
GEORGE M. BERINGER.....Camden, N. J.

31. PROPRIETARY ASSOCIATION.

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32. COMMITTEE ON EBERT PRIZE.

(Appointed by the Scientific Section.)

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PAUL S. PITTENGER.....Philadelphia, Pa.

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JOSEPH L. MAYER.....New York, N. Y.
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E. L. PATCH.....Boston, Mass.
W. T. HOVER.....Denver, Colo.
H. K. MULFORD.....Wayne, Pa.

36. FACULTIES IN PHARMACY SCHOOLS.

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37. GENERAL MEMBERSHIP COMMITTEES.

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F. H. FREERICKS, Cincinnati.
M. N. FORD, Columbus.
E. C. DAVIS, Akron.
O. U. CASSIDY, Youngstown.
ELIZABETH JENKINS, Dayton.
CASWELL A. MAYO, Cincinnati.
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A. R. MAAS, Los Angeles.
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Nevada—JOSEPH C. PIERCY, *Chairman*, Tonopah.
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New Mexico—BERNARD C. RUPPE, *Chairman*, Albuquerque.
Utah—JOHN CULLEY, *Chairman*, Ogden.
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ORGANIZATION OF LOCAL BRANCHES 1922.

(The General Secretary should have prompt notice of corrections and changes. To maintain its activity and representation each Branch should see that at least three of its meetings during the year are reported in the JOURNAL. Lists of officers had not been received by May 1 from Branches not reported.)

BALTIMORE BRANCH.

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B. OLIVE COLE, *Secretary.*
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CHICAGO BRANCH.

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(Meets during week of August 14, Cleveland, Ohio.)

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(Cleveland, August 14–19.)

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(Bedford Springs, Pa., June 12–17.)

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(Detroit, Mich., September 25–29.)

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(Colorado Springs, October 2–5.)

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1922 STATE PHARMACEUTICAL ASSOCIATION MEETINGS.*

STATE.	DATE.	PLACE.	PRESIDENT.	SECRETARY.	LOCAL SECRETARY.
Alabama	June 7–8	Gadsden	L. C. Lewis, Tuskegee	W. E. Bingham, Tuscaloosa	D. W. Duff
Arkansas	May 9–11	Little Rock	W. J. Conery, Lonoke	Miss Mary A. Fein, Little Rock	W. L. Vance
California	May 23–25	Catalina Island	A. L. Hawkins, Pasadena	E. A. Henderson, Los Angeles	A. L. Tienken, Lindsay.
Colorado	June 6–8	Colorado Springs	F. E. Mortenson, Pueblo	Charles J. Clayton, Denver	
Connecticut	June 20–22	Eastern Point	Frank A. Sisk, Norwich	P. J. Garvin, Middletown	
Delaware	June 1	Wilmington	N. B. Danforth, Wilmington	R. H. Newsome, Wilmington	
District of Columbia	April 11	Washington	Frank T. Stone, Washington	C. J. Fuhrmann, Washington	
Florida	June 14–15	St. Petersburg	W. G. Perry, Miami	J. H. Haughton, Palatka	J. D. Pearce
Georgia	June	Tybee Island	Jabe Stamps, Thomaston	T. A. Cheatham, Atlanta	
Idaho	October 12–13	Boise	D. S. Whitehead, Boise	T. M. Starrh, Boise	
Illinois	June 27–29	Springfield	Fred W. Rauth, Springfield	W. B. Day, Chicago	Robert A. Clarkson
Indiana	June 20–22	Culver	B. M. Keene, Indianapolis	Wm. A. Oren, Indianapolis	
Iowa	January 24–25	Des Moines	George Judisch, Ames	Al Falkenhainer, Algona	
Kansas	May 23–25	Kansas City	F. W. Ekstrand, Salina	J. Will Kelley, Topeka	M. Backus
Kentucky	June 21–22	Crab Orchard Springs	P. C. Andrews, Russellville	J. W. Gayle, Frankfort	E. R. Coleman, Stanford
Louisiana	May 9–10	Monroe	M. Stolzenthaler, New Orleans	Geo. W. McDuff, New Orleans	Miss M. Comiskay
Maine	September 13–15	Bar Harbor	Geo. W. Rankin, Portland	Dr. M. L. Porter, Danforth	
Maryland	June 26–29	Buena Vista Springs, Pa.	R. E. Lee Williamson, Baltimore	Dr. E. F. Kelly, Baltimore	J. H. Dow
Massachusetts	June 14–15	Swampscott	Wm. H. Glover, Lawrence	James F. Guerin, Worcester	
Michigan	June 6–8	Ann Arbor	John G. Steketee, Grand Rapids	Louis V. Middleton, Grand Rapids	Walter Blome
Minnesota	February 1923	St. Paul	Harry Trowbridge, Austin	Gustav Bachman, Minneapolis	
Mississippi	June 13–14	Biloxi	P. K. Thomas, Tupelo	A. S. Coody, Jackson	J. A. Moss
Missouri	June 13–16	Excelsior Springs	Fred H. Swift, St. Louis	H. M. Whelpley, St. Louis	H. C. Tindall
Montana	July 10–12	Great Falls	Fred A. Woehner, Great Falls	J. A. Riedel, Boulder	A. T. Smiley
Nebraska	June 20–22	Fremont	W. E. Clayton, Grand Island	J. G. McBride, University Place	W. A. Goodwin
New Hampshire	June 29–30	Not as yet selected	John R. Kelly, Newport	Percy Calligan, Manchester	
New Jersey	June 13–16	Lake Hopatcong	E. T. N. Stein, Montclair	Jeannot Hostmann, Hoboken	Harry Crooks
New Mexico			B. Ruppe, Albuquerque	Mrs. M. L. Powell, Albuquerque	
New York	June 19–23	Richfield Springs	Herbert G. Wright, Syracuse	Edward S. Dawson, Syracuse	
North Carolina	June 27–29	Winston-Salem	I. W. Rose, Rocky Mount	J. G. Beard, Chapel Hill	A. A. James
North Dakota	August 1–3	Jamestown	D. E. Bigelow, Jamestown	W. F. Sudro, Fargo	C. W. Bitner
Ohio	July 17–21	Cedar Point	H. M. Highfield, Zanesville	Theo. D. Wetterstroem, Columbus	L. A. Biehl, Sandusky
Oklahoma	April 11–13	Oklahoma City	Clarence Pullen, Muskogee	H. S. Shackelford, Wynnewood	H. S. Caldwell
Oregon	June 5–7	Roseburg	Claude J. Kem, Cottage Grove	A. W. Allen, Portland	
Pennsylvania	June 20–22	Buena Vista Springs	J. C. Peacock, Philadelphia	Louis Saalbach, Pittsburgh	H. J. Mentzler
Rhode Island		Hamilton	Earl H. Mason, Providence	O. E. Barrett, Providence	
South Carolina	July	Florence	S. C. Hodges, Greenwood	F. M. Smith, Charleston	M. Goebel
South Dakota	August 16–18	Huron	C. C. Maxwell, Arlington	E. C. Bent, Dell Rapids	Harry Sanders
Tennessee	July 11–13	Memphis	W. Gay Clark, Morristown	David J. Kuhn, Nashville	T. O. Duff
Texas	June 13–15	Fort Worth	J. W. Collins, Amarillo	W. D. Adams, Forney	C. B. Ellis
Utah	May 24–25	Salt Lake City	Harry Coombs, Salt Lake City	Edwin C. Smith, Salt Lake City	
Vermont			E. B. Hyde, Brandon	F. W. Churchill, Proctor	
Virginia	June 20–22	Natural Bridge	John E. Jackson, Tazewell	A. L. I. Winne, Richmond	Luther Suff, Roanoke
Washington	July 31–Aug. 2	Spokane	G. C. Norton, Tacoma	E. E. McMillan, Tacoma	
West Virginia	June 13–15	Pence Springs	F. C. Kramer, Parkersburg	P. H. Kelly, Montgomery	S. S. Rose, Hinton
Wisconsin	June 27–30	Green Lake	O. J. S. Boberg, Eau Claire	E. G. Raeubet, Milwaukee	B. F. Leide, Milwaukee
Wyoming	Aug. 7–9	Laramie	Ruby Schultz, Worland	L. R. Tyson, Sheridan	A. H. Cordiner

* Secretaries will oblige by making corrections and giving list of new officers. Please address JOURNAL A. PH. A., 253 Bourse Bldg., Philadelphia, Pa.

EDITORIAL NOTES

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THE TREATMENT OF CARBON MONOXIDE POISONING.

Carbon monoxide poisoning is one of the most widely distributed and most frequent of industrial accidents, says the U. S. Public Health Service. The gas is without color, odor or taste. It is an ever-present danger about blast and coke furnaces and foundries. It may be found in a building having a leaky furnace or chimney or a gas stove without flue connection, such as a tenement, tailor shop, or boarding house. The exhaust gases of gasoline automobiles contain from 4 to 12 percent of carbon monoxide, and in closed garages men are not infrequently found dead beside a running motor. A similar danger may arise from gasoline engines in launches. The gas is formed also in stoke-rooms, in gun turrets on battleships, in petroleum refineries, and in the Leblanc soda process in cement and brick plants. In underground work it may appear as the result of shot firing mine explosions, or mine fires, or in tunnels from automobile exhausts or from coal or oil burning locomotives.

Carbon monoxide exerts its extremely dangerous action on the body by displacing oxygen from its combination with hemoglobin, the coloring matter of the blood which normally absorbs oxygen from the air in the lungs and delivers it to the different tissues of the body.

Oxygen will replace carbon monoxide in combination with hemoglobin whenever the proportion of oxygen in the lungs is overwhelmingly greater. Therefore:

1. Administer oxygen as quickly as possible, and in as pure form as is obtainable, preferably from a cylinder of oxygen through an inhaler mask.

2. Remove patient from atmosphere containing carbon monoxide.

3. If breathing is feeble, at once start artificial respiration by the prone posture method.

4. Keep the victim flat, quiet, and warm.

5. Afterwards give plenty of rest.

DELETERIOUS EFFECTS OF ACACIA FOR TRANSFUSION.

In an article "Hemorrhage as a Form of Asphyxia" (*Journal A. M. A.*, March 11, 1922, p. 697) Henderson and Haggard point out that although acacia solution is apparently distinctly beneficial, immediately after injection, it does not improve the chance of recovery of animals which have been subjected to the so-called "Standard Hemorrhage."

The foregoing statement is taken from an editorial of the *Journal A. M. A.* under above caption; reference is also made therein to a report of the Swedish surgeon, H. Olivecrona, wherein he warns against the indiscriminate use of acacia in intravenous injections, and the *Journal* quotes G. N. Stewart (Cleveland) as saying, that "the use of acacia is unphysiologic." The editorial closes with the comment that "the intravenous method of administering drugs is always accompanied by considerable risk of injury to the patient. It is unjustified with new and untried remedies, and even with those which chemically and pharmacologically apear to be inert and inactive."

ERGOT AND ERGOT SUBSTITUTES.

Of all the active substances that have been extracted from ergot, Stoll's ergotamine appears to be the most important. This substance has been obtained in well-defined crystals, and exists in ergot of rye in very varying amounts, and may even be altogether absent. Even in exceedingly dilute solution it produces long-continued contraction of the uterus, depresses the blood pressure, produces the char-

* Secretaries will oblige by making corrections and giving list of new officers. Please address JOURNAL A. PH. A., 253 Bourse Bldg., Philadelphia, Pa.

acteristic action on the comb and wattle of fowls, etc. Other active constituents of ergot preparations are tyramine, histamine, and ergotoxine. Tyramine and histamine do not stand in any relation to ergotamine; they are to be regarded as intermediate substances resulting from the decomposition of proteids. It has been shown by Guggisberg and Bigler that an ergot extract is continually altering in physiological activity, and probably the change in the physiological action proceeds *pari passu* with the progressive decomposition of the proteids involved. These products may at first be useful and the ergot preparation active, but eventually these useful substances undergo further change and the ergot preparation becomes inactive. Among the proposed substitutes for ergot the following may be mentioned: *Capsella Bursa-pastoris, Senecio vulgaris, Erigeron canadense, Hedera helix, Gossypium herbaceum, Erodium cicutarium, urtica urens, U. dioica, and Ustilago maidis.* These do not contain ergotamine or any substance corresponding to it, but yet in some cases exhibit an action resembling that of ergot. Such an action would be shown by those that contain active intermediate or end-products of the decomposition of proteids, as, for instance, *Capsella Bursa-pastoris,* which has been shown to contain tyramine. This plant also contains the very active acetylcholine which has possibly been derived from choline. Considering how rich fungi are in proteids, it is surprising that so few are known to possess properties similar to those of ergot.—A. Tschirch (*Schweiz. Apoth. Zeit.*, 60, p. 1; through *Journal and Pharmacist*, March 11, '22, p. 196).

"WHAT OUGHT THE UNITED STATES PHARMACOPOEIA TO CONTAIN?"

Under above caption,* Dr. Horatio C. Wood, Chairman of the Subcommittee on Scope of U. S. P. Revision Committee, points out certain inaccuracies in the article by Dr. Osborne printed in the *Journal A. M. A.*, March 4, p. 639.

"First, the final decision as to the admissibility of therapeutic agents now rests solely in the hands of the medical members of the committee.

"Second, Dr. Osborne gives a list of 'substances recommended for deletion because they cannot be standardized.' On this list are a number of substances which both can be, and are, standardized. Many urgently require standardization; for instance, if there were no legal standard for distilled water, pharmacists would be at liberty to employ any kind of water, which in case of certain drugs—as silver nitrate—might have serious influence on the final result of the prescription. Again, when we remember what a variety of substances are sold under the name of soap, some of them containing free alkali, some containing various irritant fatty acids or poisonous coloring matters, and when we remember that soap is an ingredient in compound cathartic pills and other preparations for internal use, it appears that soap is in much need of pharmaceutic standardization. What Dr. Osborne means by the expression 'cannot' be standardized is a little obscure. Why a standard for flaxseed (linum) is any less explicit or enforceable than a standard for strophanthus seed does not appear obvious. Of the list of substances which he says cannot be standardized, the great majority *are* standardized.

"Third, in regard to the spices, there is room for difference of opinion as to which are of sufficient therapeutic importance to justify recognition; but to dismiss them all cavalierly with the statement that 'such aromatic oils as are needed may be listed' seems to be going too far. For instance, oils of capsicum and of ginger are neither commercial articles nor therapeutically active. I myself greatly prefer powdered mustard seed as a counterirritant to the oil of mustard. (Incidentally, Dr. Osborne later dismisses mustard oil.) It should be remembered that there are few substances on the market more freely adulterated than the spices. If they have therapeutic uses, which I believe some of them do have, they require standardization.

"Fourth, Dr. Osborne gives a long list of drugs and preparations that he believes are therapeutically undesirable. Such expressions of personal views may be of value if collected from a large number of sources, but Dr. Osborne makes the very common mistake of forgetting that the Pharmacopoeia is the legal standard for drugs from the Philippines to Cuba and from Alaska to Florida, and that the citizen of San Francisco or New Orleans has just as much right to protection from impure drugs as the citizen of New Haven. For example, Dr. Osborne apparently uses sodium bromide in preference to all others; other physicians prefer the ammonium or calcium salt. There are quite a number of drugs on his list that he believes should be

* *Journal A. M. A.*, March 25, p. 915.

deleted which I have used frequently with great satisfaction. He may not like the flavor of anise water, but many persons do, and find it a very useful vehicle. As Dr. Osborne does not specialize in skin diseases, he naturally has little use for sodium thiosulphate or diachylon ointment; but both are widely used by dermatologists.

"Another common error into which Dr. Osborne falls is forgetting that substances, not directly valuable themselves as therapeutic agents, are important as the source of widely used drugs. For instance, granulated ferrous sulphate, which he would delete from the Pharmacopoeia, is one of the bases of the very popular Blaud's pill; hypophosphorus acid is used in the preparation of syrup of ferrous iodide; lead oxide is an essential in the preparation of solution of lead subacetate, etc. Any assertion that a chemical which enters into a pharmaceutical preparation does not require standardization I cannot assent to. If, for instance, in the manufacture of syrup of ferrous iodide, a hypophosphorus acid was used which was contaminated with barium or oxalic acid (each of which is used in manufacturing hypophosphorus acid) the finished syrup might be highly toxic.

"The Subcommittee on Scope realizes that it is impossible to make a pharmacopoeia which would meet all of the widely divergent views of the medical profession as to what should be included; but it has striven to reflect the usage of the great mass of the competent physicians of the country."

REMEDIES FOR CERTAIN DEFECTS IN MEDICAL ORGANIZATION AND SERVICE.

In a comprehensive paper, published in the *Monthly Bulletin* of the Department of Health, Dr. Louis I. Harris, Director of the Bureau of Preventable Diseases, after reviewing and commenting upon "factors which have operated to create the present unorganized and confused state of medical practice and of private welfare activities" makes certain proposals for reorganization. "It is strange," he says, "how the medical profession has failed to recognize the remarkable opportunities there are, for service primarily, and for personal benefit as well, in practice which is reorganized so as actually to make the prevention of disease a conspicuous part of everyday work."

In a foreword to Dr. Harris's statement, Health Commissioner Copeland said: "Although I do not endorse or share some of the critical views expressed by Dr. Harris, I commend his chief proposals for the reorganization of medical practice to the judgment of the members of the medical profession."

Dr. Harris said that to ignore the new social demands that have arisen for those who practice medicine is to challenge various lay groups to take entirely into their own hands the reorganization and the control of medical service. He said that there are being established medical enterprises and institutions which threaten the stability of the present system of medical service and increase the existing confusion. In the face of this, he said, some doctors are lulled into fancied security by their ready acceptance of assurances that the prevalence and the effects of poverty have been greatly exaggerated, and that the number of sick who are without medical care is negligible.

"The medical profession has been aroused from its apathy," Dr. Harris said. "The challenge this situation offers and the inroads which pseudo-scientific and pseudo-religious and commercial cults and frauds of various kinds have made upon the medical profession have thus far failed to bring leaders with large vision in whose support the profession could be united. Under the circumstances, private, semi-private and official organizations have dominated the situation. The medical profession in default of such broad-minded and able leadership has thus far waged what in effect has been a defensive and obstructive campaign.

"The quacks, the faith healers, the varied types of masseurs in masquerade, the spine drummers and the joint manipulators, and others who have exalted a single weapon or method of regular practice into a 'system' of healing and cure-all, are never reserved in the promises they hold forth, nor are they embarrassed by humility or modesty. Compare their effrontery with the humility of Virchow, a great pathfinder in medicine and a successful physician."

Dr. Harris said that the development of specialists has reached a point where it affects the economic status of the general profession and the public as well. While no just person, he said, would begrudge the surgeon who performed a difficult operation a reasonable compensation for his service, it cannot be overlooked that in many cases the work of specialists is either greatly overpaid or is

rewarded out of all proportion to the fees paid general practitioners.

Dr. Harris says that economic difficulties are likely to result from the pay clinic. Especially do these clinics affect the specialist since it has been shown, he said, that a great majority of dispensary cases come for specialists' consideration.

PERSONAL AND NEWS ITEMS.

Dr. H. V. Arny has been named Remington Medalist for 1922. This is the third award; the others thus honored are Prof. John Uri Lloyd and Dr. James H. Beal.

The Remington medal is awarded annually by a committee consisting of the former presidents of the American Pharmaceutical Association, the secretary of the New York branch acting as secretary for this committee. The 1922 award of the medal will take place at a banquet tendered to Professor Arny by the New York branch at the Hotel Pennsylvania on the evening of May 15. Dr. Jacob Diner, the senior former president of the branch, will make the award.

Prof. Joseph L. Mayer of the Brooklyn College of Pharmacy was tendered a dinner commemorating the 25th anniversary of his service in the institution of which he is a faculty member. The event was celebrated April 11 at the Hotel Bossert, Brooklyn, and more than 200 friends of the honor guest were present; Dr. William C. Anderson presided as toastmaster. Among the speakers were Drs. Jacob Diner, Royal S. Copeland, Elias H. Bartley and Leon Lascoff. Congratulatory letters and telegrams from various sections of the state and adjoining states were read. Professor Mayer was presented with a watch, chain and charm, so that he may time the next quarter of a century in a continued useful service.

Dr. Frederick B. Power, in charge of the phyto-chemical laboratory of the Bureau of Chemistry, has been named as representative of the bureau in the Division of Federal Relations of the National Research Council.

More than fifty years have passed since the Chicago fire. *The Chemist and Druggist* of April 15, 1872 announced that "the list of contributors to the Chicago College Fund will be closed." The sum donated by British druggists amounted to about 500 guineas; besides many books and apparatus.

The centenary of Pasteur's birth will be celebrated May to October of next year. It is proposed to erect a statue facing the Strasbourg University, where, as a professor, Pasteur commenced his work. An exhibition of hygiene and bacteriology will be opened and a congress of scientists engaged in these branches will be held.

This centennial year of Pasteur should encourage research endowments.

A. Ph. A. Fund for Research.—The American Pharmaceutical Association has available a sum amounting to $360, which will be expended after October 1, 1922, for the encouragement of research.

Investigators desiring financial aid in their work will communicate before June 1, with Prof. H. V. Arny, Chairman of the A. Ph. A. Research Committee, 115 West 68th St., New York, giving their past record and outlining the particular line of work for which the grant is desired.

Baskerville Scholarship Planned by Students.—A fund to establish a scholarship at the College of the City of New York as a tribute to the memory of Dr. Baskerville, head of the department of chemistry since 1904, has been started by students of the day and evening sessions.

Current plans provide for the presentation of an annual prize, but it is hoped ultimately to establish a Baskerville Research Scholarship in Chemistry.

Friends and neighbors of **Dr. Henry H. Rusby** to the number of over a hundred gathered in the forum room of the Forest Hill (Newark, N. J.) Presbyterian Church on the evening of April 6 to do honor to the returned explorer, who, with Mrs. Rusby and their daughter, Miss Marguerite, was present.

Curtis R. Burnett presided. Rev. John S. Carlile spoke at length, others made brief remarks and all joined in the welcome and congratulations.

Three other members of the Mulford Expedition have arrived at home; they are: Dr. William Mann, assistant entomologist of the United States Department of Agriculture; Orland E. White, botanist of the Brooklyn Botanic Garden, and Nathan E. Pearson, assistant ichthyologist of the University of Indiana.

H. C. Christensen, secretary of the National Association of Boards of Pharmacy with the collaboration of other N. A. B. P. officials, has prepared a chart giving a tabulated summary of requirements for state pharmaceutical licensure. While the secretary asks for further

suggestions to extend the usefulness of the compilation, the work reflects credit and shows painstaking care.

Greater uniformity in legislation is evident, but there is possibility and necessity for further improvement, and this tabulation points the way.

Dean Dr. Jacob Diner of Fordham University College of Pharmacy was presented with a Hudson automobile by the students, alumni and faculty members, also with a framed testimonial expressing the friendship and esteem of the donors. Professors Gustave Horstmann and Otto Canis spoke for the faculty; Messrs. Robinson, Strauss and Israel represented the classes and alumni.

Charles L. Parsons, secretary of the American Chemical Society, has submitted an offer for the Muscle Shoals project. There seems to be little information available about it. It is said to be contingent upon government completion of the dams, and to contemplate development of nitrogen industries at the Shoals.

Page 1 of No. 1, volume 1 of *The Squibb Message* carries a good picture of the late Dr. Edward R. Squibb. The purpose of the publication is expressed in the hope that it will promote the broader harmony between producer and retailer that makes for joint success.

Revista del Collegio Farmaceutico de la Habana is the name of a new pharmaceutical publication of Cuba which is in charge of Drs. Felipe Pazos, Francisco de la Carreva and Ignacio G. Noble. The journal will devote attention to pharmacy, the pharmaceutical associations and the College of Pharmacy. There is evident throughout the spirit to advance professional pharmacy. We extend best wishes for success and hope the publication will be represented at the seventieth meeting of the American Pharmaceutical Association, and that many of the pharmacists of our close neighbor will be present, for their friendship is highly regarded.

Editorial consideration is given to "The Digest of Comments on the Pharmacopoeia of the United States of America and on the National Formulary" in the *Pharmaceutical Journal and Pharmacist* of April 15. Regret is expressed that there is no corresponding compilation in Great Britain. The following lines conclude the editorial: "It is doubtful if a more effective aid to revision could be devised."

Bulletin No. 9, issued by the Drug Trade Board of Public Information, gives publicity to the last volume of the YEAR BOOK A. PH. A. Description of the contents, reference to the authors and scope of the work is followed by an appreciation in these words: "The value of this annual review of pharmaceutical and allied literature is beyond estimate to the research worker, the student and the pharmacist."

A. R. Elliott Publishing Co. (*American Druggist*), publishers of the New York Medical Journal, has purchased from Willian Wood & Co., the Medical Record. By this purchase Mr. Elliott has consolidated under one head four great weekly medical journals, which will now appear as the *New York Medical Journal and Medical Record*.

Ex-President John G. Godding and wife accompanied Boston Commandery K. T. to the triennial conclave in New Orleans. The S. S. "Cristobal" was chartered for the trip; Easter Sunday was spent in Kingston, Jamaica, the Atlantic side of Panama Canal was reached April 18th and the Pacific on the 19th; they arrived in New Orleans on the 24th, and hope to be at home May 5.

Prof. Charles H. LaWall spoke before the Community Club of Glenside, Pa., on April 25, on foods and food laws.

C. S. Brinton, of the U. S. Bureau of Chemistry and Appraisers Stores, Philadelphia, recently gave an illustrated lecture to the Chemistry Club of the Central High School, on "Pure Food Laws."

The birthday of **E. G. Raeuber** was celebrated by the Milwaukee Veteran Drug Club, February 16.

J. L. Hopkins, F. E. Holliday and **Ralph R. Patch** spoke before New York section of the American Pharmaceutical Manufacturers' Association at the Drug and Chemical Club, April 5.

The parents of our fellow-member **Edward H. Walsdorf,** New Orleans, celebrated their golden wedding anniversary March 7; children, grandchildren and great grandchildren were present, also two of the bridesmaids who stood with Mrs. Walsdorf on the wedding day in 1872.

Turner F. Currens is making an extended trip in the Southern States.

William Mittelbach, for twenty-eight years treasurer of the Missouri Pharmaceutical Association, is secretary of the Boonville School Board.

Ivor Griffith, Chairman of the Section on Practical Pharmacy and Dispensing, A. Ph. A., gave an illustrated lecture and demonstration on and with "One Drop of Blood," as part of the popular series of the lecture course at the Philadelphia College of Pharmacy. A large audience, constituted in part of hospital technicians and internes, attested to the value and interest of this type of instruction.

Louis G. Clark, of Portland, Ore., is on an extended trip in the Orient. He will not return for several months.

The New York Quinine & Chemical Works have moved their business offices to more commodious quarters at 152–154 William Street, from 135 William Street.

OBITUARY.

FRANK A. SOUTHARD.

Frank A. Southard, Jr., has advised us of the death of his father, Frank A. Southard. The deceased was a first class Pharmacist in the Public Health Service, he had been in the Service for twenty-two years and held a fine record; many members will remember him in connection with the Indianapolis meeting of the American Pharmaceutical Association, which he attended as delegate and representative. He had planned to be present at the Cleveland meeting. Following partial recovery from influenza, he was ordered to the Buffalo Hospital for rest. Weakened by illness, the fatigue of the trip brought on a serious condition which terminated in his sudden death March 27. Pharmacist Southard's last station was at Arrowhead, California; he joined the Association in 1903, and was an enthusiastic member.

SOCIETIES AND COLLEGES.

SUBSCRIPTIONS TO AMERICAN PHARMACEUTICAL ASSOCIATION HEADQUARTERS BUILDING FUND.

(APRIL 28, 1922.)

Although the letters of invitation to participate in the creation of the above-named fund were mailed only a short time before the report was sent in for publication, some have responded.

Every pharmacist should avail himself of the opportunity to participate in this undertaking, which will reflect credit and insure a recognition never before accorded to pharmacy.

No.		
1.	Theodore Weicker, New York, (Paid)	$250.00
2.	Lewis F. Grewe, St. Louis,	5.00
3.	William T. Adams, Chicago	10.00
4.	W. P. Thomason, Guntersville, Alabama	10.00
5.	M. H. Potter, Piggott, Ark.	25.00
6.	F. T. Shackleford, Minneapolis, Minn.	10.00
7.	Emil L. Boerner, Iowa City, Ia.	100.00
8.	Fred G. Kustermann, Minneapolis, Minn.	5.00
9.	Julius M. Keil, Western Springs, Ill. (Paid)	5.00
10.	R. L. Francis, Fredericksburg, Va.	10.00
11.	Ernest Berger, Tampa, Fla.	5.00
12.	Isador L. Zeman, Pittsburgh, Pa.	25.00
13.	Arthur Van Hooser, Metropolis, Ill.	10.00
14.	F. W. Meissner, La Porte, Ind.	100.00
15.	Herman L.————Milwaukee, Wis.	100.00
16.	F. Wilbur Neuman, Canton, Ohio.	2.00
17.	A. R. L. Dohme, Baltimore, Md.	150.00
18.	Thos. D. McElhenie, Brooklyn, N. Y.	100.00
19.	E. W. Parker, Victoria, Texas	25.00
20.	P. Henry Utech, Meadville, Pa.	50.00
21.	J. D. Yongue, Pickens, S. C.	5.00
22.	James H. Adams, Sagamore, Mass.	10.00
23.	F. W. Nitardy, Brooklyn, N. Y.	50.00
24.	Jacob J. Cohan, Chicago, Ill.	10.00
25.	Herbert Haynes, Providence, R. I.	5.00
26.	S. Bienstock, Hartford, Conn.	5.00
27.	William H. Rudder, Salem, Ind.	25.00
28.	S. L. Hilton, Washington, D. C. (Paid)	100.00
29.	J. L. Lascoff, New York City	50.00
30.	Joseph L. Lemberger, Lebanon, Pa.	20.00
31.	Albert G. Groblewski & Co., Plymouth, Pa.	10.00
32.	Redmond Mayo, Washington, D. C.	25.00
33.	G. D. Searle & Co., Chicago, Ill.	50.00
34.	William Gray, Chicago, Ill.	25.00

35. A. A. Poehner, Ph.G., San Francisco, Cal.	50.00
36. Charles W. Holzhauer, Newark, N. J.	25.00
37. B. F. Quackenbush, New York City	20.00
38. Fred I. Lackenbach, San Francisco, Cal.	25.00
39. Daniel J. Frey, Salem, Oregon	25.00
40. S. Ross Campbell, Ventnor, N. J. (Paid)	100.00
41. Leopold Simon, San Antonio, Texas	1.00
42. W. A. Clantz, Jr., Spearman, Texas	2.50
43. Wallace J. Formhals, Sparland, Ill.	5.00
44. Clyde L. Eddy, New York City	10.00
Total	$1,650.50

IN WHICH SECTION OF THE AMERICAN PHARMACEUTICAL ASSOCIATION ARE YOU MOST INTERESTED?

In this issue of the JOURNAL you will find a roster of Association officers, list of Committees and Section officers. This is suggestive—if you are a member of a committee, to see that the work for which the committee was appointed is properly reported—if you are a Section officer, to prepare the program and send it to the JOURNAL. Papers should be sent to the Chairman or Secretary of the Section as early as possible; when papers are delayed, titles of the papers should be sent in. Abstracts of the papers should accompany such contributions; if possible, it is desirable that a copy of the paper be sent to the JOURNAL.

ABSTRACTS OF SOME OF THE PAPERS READ AT THE SPRING MEETING OF THE AMERICAN CHEMICAL SOCIETY, BIRMINGHAM, ALA.

A NEW SOURCE OF SANTONIN.*

By Arno Viehoever and Ruth C. Capen.

As a result of a survey of American plants it is evident that santonin can be obtained from *Artemisia mexicana* and *Artemisia neo-mexicana*, which grow wild in Mexico, New Mexico, and neighboring states.

The survey thus far made comprises 17 species and plant material obtained from 30 different sources. The santonin isolated was identified by the form and refractive indexes of the crystals, the melting point, furfural reaction, and the formation of santonin periodide.

Though no quantitative data are as yet on hand, the manufacture of santonin now quoted at $150 per pound, from domestic sources, appears a distinct possibility.

*Contribution from the Pharmacognosy Laboratory, Bureau of Chemistry, Dept. of Agriculture.

A LABORATORY DISINFECTANT SOLUTION TO DISPLACE MERCURIC CHLORIDE.

By Harper F. Zoller.

Sodium hypochloride solution furnishes a means of providing an efficient economical and safe sterilizing agent for use in biological laboratories. In the preparation of the solution it is essential to maintain a sufficiently high hydroxyl ion concentration for maximum stability—about p_H 10.5. Solution containing about 0.15 percent available chlorine (0.32 percent sodium hypochlorite) will destroy the most persistent of microörganisms within ten minutes.

THE DETECTION AND ESTIMATION OF INORGANIC ACTIVATORS IN COMMERCIAL RENNIN AND PEPSIN PREPARATIONS.

By Harper F. Zoller.

An activator-free pepsin or rennin solution coagulates dialyzed milk with great difficulty at the optimum temperature (41° C.) for rennin action. The presence of calcium or magnesium ions accelerates the enzyme action and gives the coagulum its normal physical consistency. The differential between the rate of coagulation in dialyzed milk and in undialyzed milk furnishes a factor, which, when compared with a similar factor obtained from activator-free enzyme solution under the same set of conditions, furnishes a means of roughly estimating the quantity of activator or accelerator present.

FURTHER EXPERIMENTS ON THE ISOLATION OF VITAMINE.

By Atherton Seidell.

The method as now used for the preparation of highly active vitamine fractions consists in heating fresh brewers' yeast mixed with water to about 90° C.; adsorbing the vitamine present in the filtered solution by means of English fuller's earth; extracting this latter with saturated barium hydroxide solution; and concentrating the extract, after acidifying with sulphuric acid and filtering, by rapid vacuum distillation.

More detailed experiments on the precipitation of the vitamine in these concentrated extracts by means of silver salts have shown that approximately one-third of the solids present unite with the silver salts to form in-

soluble silver compounds. About one-half of the total vitamine, as determined by feeding experiments on pigeons, is present in these insoluble silver precipitates and the other half remains in the filtrate. This unexpectedly large unprecipitable fraction of the vitamine raises the suspicion that the portion accompanying the silver precipitates may not be in chemical combination but simply held by adsorption. Further studies of the silver precipitates and filtrates are in progress.

THE TOXIC CONSTITUENT OF GREASEWOOD. (*Sarcobatus vermiculatus.*)

By James F. Couch.

Greasewood is an important forage plant for sheep on the winter ranges in the west. It is common in the semi-arid, alkali valleys of the far-western states, and, while it is extensively grazed, it has been found by Marsh, Clawson and Couch to be poisonous. Chemical examination of the edible portions of the plant showed that they contain a large proportion of oxalic acid and unusually large amounts of sodium and potassium salts. Toxic alkaloids, glucosides, and saponins were absent and it was shown by experiments upon sheep that the poisoning is due to sodium and potassium oxalates. The leaves of the plant contain the largest proportion both of ash and of oxalic acid; in the stems most of the oxalic acid is combined as calcium oxalate.

NATIONAL ASSOCIATION OF RETAIL DRUGGISTS MEETS IN DETROIT SEPTEMBER 25–29.

Detroit has been chosen as the place for holding the twenty-fourth annual meeting of the National Association of Retail Druggists, and September 25 to 29 as the time. Headquarters will be at the Statler Hotel. The second annual meeting (1900) of the association was held in Detroit.

INTERNATIONAL PHARMACEUTICAL FEDERATION.

The third general convocation of the officers and the central committee of the International Pharmaceutical Federation met in Brussels, April 28 and 29.

PROGRAM OF THE FIRST DAY.*

1. Correspondence.
2. Considering the present situation, and reconstruction of the Federation.
3. Proposition—in view of the supervision of activities during the war—of rendering the Bureau and Central Committee permanent, and of filling vacancies.
4. Reading Financial Report and Budget.
5. Examination of reports from Commissions received at the Bureau.
6. International Secretary of Pharmacopoeias.
7. International Pharmaceutical Nomenclature.

At 7:30 P.M., there was a dinner tendered to the Central Committee by the Pharmaceutical Society of Brussels, in the National Pharmaceutical Headquarters.

SECOND DAY.

1. Address of the President.
2. Report of the Secretary.
3. Correspondence.
4. Financial Report.
5. Budget.
6. Election of The Bureau.

Mr. H. J. Möller of Copenhagen is dead; Dr. H. Martin of Paris does not desire reelection. The place of Dr. H. Saltsmann is vacant on account of the resignation of Deutsche Apotheker Verein. The other members of the Bureau are eligible.

7. International Secretary of Pharmacopoeias. Consideration of the reports from MM. A. Tschirch and L. van Itallie and from The Committee.
8. Organization of International Pharmaceutical Congress. Consideration of the report from MM. Cuérel and Vuilleumier.
9. International Pharmaceutical Nomenclature. Consideration of the reports from MM. C. Rousseau, Enell and E. White, and of the communication from the American Pharmaceutical Association.
10. Pharmaceutical Instruction. Consideration of the reports from The Commission.

At 12:30 P.M., a luncheon was tendered to participants at Headquarters. At 4:45 P.M., a reception was held at the City Hall (Hotel de ville), and at night members were invited to the opera at the Théâtre Royal.

President: Prof. Dr. L. VAN ITALLIE.

Secretary General: Dr. J. J. HOFMAN.

ORGANIZATION IN THE AMERICAN MEDICAL ASSOCIATION.

Report of a symposium on coöperation between the constituent and component branches in the American Medical Association is printed in several issues of its *Journal* of the last few months of 1921; at this time the reprinting of a few extracts may be of interest.

* The program was received prior to May 1.—EDITOR.

"Dr. Holman Taylor, Fort Worth, Texas: I want to lay the predicate for this discussion on three problems. We shall never secure the coördination that we require for the best performance of the function that should be ours until the American Medical Association has reorganized, until the several kinds of membership have been abolished. There should be one membership only, and when a man joins his county society he should belong to all of them and pay his dues there for the whole thing. In so doing he has bought an interest in the Association. He owes it something, and it owes him something. I doubt whether the time is ripe for advancing such an idea, but certainly we might be thinking about it."

"Dr. W. E. Musgrave, San Francisco: The fundamental principles of organization apply to the medical profession exactly as they do to every other vocation or activity of mankind. These problems have been so successfully worked out by religious bodies and business organizations that we can do no better than to copy them. Every physician has a dual function. He has the professional care of the sick patient, and he is charged with the duty and responsibility of citizenship, and that is true of every other man, whether he be a banker or a lawyer. The trouble with us as a profession is that by some curious method we have been trained as individuals; we have not had the character of training that every other young man that amounts to anything in the world gets; that is the training necessary for him to become an active member in organization work."

"Dr. Edward Livingston Hunt, New York: In legislative matters the medical profession should lead, not follow. Its criticisms should be constructive, not destructive. The physicians should, through their leaders, see the needs of the community in legislative matters pertaining to medicine, should initiate the proper legislation and mold it into practical measures so as to benefit the community and both enhance and advance the profession. To accomplish this desired result, the physicians of the country must be organized, interested and instructed. There are several ways in which they may be organized by the aid, advice and coöperation of the national and state officers, by the elimination of medical politics and by editorials, communications, and high character of the national and state journals. Here I might add my hearty endorsement to a bureau of publicity. It should be official and ethically conducted."

"Dr. T. B. Throckmorton, Des Moines, Iowa: * * * I have often thought it would be feasible to publish a bulletin of some sort to circulate not so much among medical men as among the laity, in which the truths concerning the things relating to medicine and the profession can be brought before the public. I have the confidence in the average American citizen that if facts are put before him and he draws a conclusion, in the majority of cases that conclusion will be correct. I simply put that idea forward at this time because it would be one way of counteracting the propaganda that is being spread by the different cults."

"Dr. Alexander R. Craig, Chicago: So far as organization is concerned, I would repeat that we have the machinery for conducting the work of the organized medical profession; but no matter how effective a piece of machinery we may have, it will be of no value unless we put motive power behind it, and the motive power is the personality of the executive officers of the several organizations, state and county, together with the membership of these organizations. This meeting will have value just in proportion to the degree in which the inspiration we have received is carried back and made effective in the work and life of the individual members of the organization."

THE PHARMACIST AND THE LAW.

GOVERNED TO DEATH.*

"That the *Courier* is not alone in its protests against the alarming growth of bureaucracy and the extension of federal authority over the lives of American citizens, is evidenced by a recent editorial of the *New York World* which quotes Senator Stanley, of Kentucky, as saying:

"'Every business man finds an inspector at his elbow, a federal sleuth at his heels. Houses are searched, homes outraged, and the public highway dappled with the blood of unoffending citizens by a multitude of agents and inspectors ignorant of and indifferent to the law of the land and the rights of citizens.'

* An editorial of *The Urbana Daily Courier*, Urbana, Ill., March 2, 1922.

"Lest anybody think that Senator Stanley, who is a Democrat, has allowed his Jeffersonian theories of government to warp his judgment, it is worth while to turn to the deliberately expressed opinions of Dr. Nicholas Murray Butler, who is not only a Republican, but who is identified with the conservative wing of his party.

"In a report to the trustees of Columbia University expressing his desire to object to the proposed federal bureau for the supervision of education, Dr. Butler used language no less vehement than that employed by the Senator from Kentucky:

" 'In the United States we are, in flat defiance of all our proclaimed principles, building a series of bureaucracies that will put to shame the best efforts of the government of the Czar of all the Russias when in the heyday of its glory. We are surrounded by agents, special agents, inspectors and spies, and the people are called upon to support through their taxes, in harmful and un-American activities, whole armies of individuals who should be engaged in productive industry.'

"Senator Stanley had described in this fashion the tendency of the 15,000 bills already introduced into the present Congress:

" 'Nobody escapes. Everything in the moral, industrial and commercial world is to be owned, operated, supervised or censored from the birth of a baby to the burial of a corpse, and the worst is not yet.'

"The passion for bureaucracy and government regulation which began under Roosevelt has now lost all sense of restraint. Outside of Bolshevist Russia, the American people are the most government-ridden people in the world, and every session of Congress, every session of state legislature, marks an extension of the system.

"Among the indictments against George III in the Declaration of Independence was this: 'He has erected a multitude of new offices and sent hither swarms of officers to harass our people and eat out their substance.'

"If George III could see the armies of officers of the American people under its own government that they have allowed to be imposed upon them, to harass them and eat out their substance, he would be astonished at his own moderation. What the fathers refused to endure the sons submit to as meekly as a flock of sheep.

"The American people are in a process of being governed to death as well as taxed to death, in order to support the armies of office-holders who have undertaken to regulate them from the cradle to the grave. What makes the matter immeasurably worse, they seem to have lost their capacity for resistance to the ever-widening rule of bureaucracy."

VALUING AN IMPORTED ARTICLE.

We are taking the liberty of reprinting the greater part of an editorial from the *Dallas News*. It was written April 25th, and perhaps by the time the JOURNAL reaches the readers the tariff contest between Senate and House will have been decided.

"When an importer brings into the United States some manna he will have to pay 10 percent ad valorem on it under the tariff bill now pending in the United States Senate. If, instead of manna, he brings in unmanufactured ivory tusks, he will have the same rate of duty on them. Manifestly the kernel of the phrase 'ad valorem' is the point at which the value shall be fixed. The House bill would fix the value at the point of importation, while the Senate bill fixes it at the point of exportation. The House bill would measure the value of manna, for example, by the 'price' . . at which comparable and competitive products of the United States were ordinarily sold or freely offered for sale. . . in the ordinary course of trade. Now the United States is not producing manna in large quantities nor manufacturing *ersatz* manna of acceptable quality, so, in order to take care of a case like this, it is provided where no comparable American product can be found to set the price, then the appraising officer shall take the sale value of manna in the United States.

"Of course the trouble about that sort of arrangement is that appraising what an unsold article is going to sell at is pretty hard to get at. The importer of manna may know what he would like to sell it at, but what he will actually sell it at is another matter. For one thing he has to know what his tariff duty will be before he can figure what he can afford to sell it for. The sale price is thus dependent on the tariff and tariff on the sale price under the House scheme.

"In case the sale value of ivory could not be conveniently established, the House bill falls back on the cost of production idea. What is the cost of producing ivory on a wild elephant in Africa? What would it cost to import ele-

phants to the United States and raise them for ivory? The putting of the questions exposes the absurdity of the plan as applied to some articles. The cost of producing manna would probably involve the best thought of the customs service for the next two generations—the manna meanwhile resting in the warehouse pending decision.

"Breaking away from these inconveniences, the Senate proposes the export value of manna, ivory and all the rest of the long list, from acids to Zingiber. The value of the country of origin is the standard—what the American importer paid for it where he got it, in short. But there is an important addendum to this decision, an addendum which fills several pages of the amended bill. Under certain circumstances the President may by proclamation raise or lower tariff duties 50 percent.

"If President Harding finds that the protection to the American manna industry is insufficient he can make the ad valorem rate 15 percent instead of 10 percent. Again, if the foreign value of tusks becomes uncertain he may change the basis of value to the value of American tusks, which would probably double or treble the duty exacted on imported tusks, provided the President found that there was such a thing as an American-grown tusk. The President is further empowered absolutely to cut off all importation of manna or tusks and any other article where he finds unfair trade practices which tend to crush out American manna and tusk growers, etc.

"Finally, if Abyssinia or the Congo discriminates against the articles of the United States, in the opinion of the President, then he is empowered by proclamation to clap onto manna, tusks and the like whatever duty he finds necessary to equalize the discrimination shown by Abyssinia and the Congo. It is not a dull and edgeless thing, this valuation weapon which the Senate has fashioned. If the President is of a mind to be arbitrary he can apparently do anything he wants to with the tariff under the proclamation powers accorded to him."

DEGREES FOR A PRICE.

A Philadelphia Public Ledger man, evidently following up evidence that degrees were being sold in Philadelphia and New York to foreigners, secured a doctor's degree by purchase; the price paid was $41.00. The *Ledger* of April 23rd printed a reduced photographic reproduction of the diploma, and the accompanying account is very interesting reading matter.

BOOK NOTICES AND REVIEWS.

Bacteriology for Students in General and Household Science. By Estelle D. Buchanan, M.S., recently Assistant Professor of Botany, Iowa State College, and Robert Earle Buchanan, Ph.D., Professor of Bacteriology, Iowa State College, and Bacteriologist of the Iowa Agricultural Experiment Station. Revised Edition. 12mo., 560 pp. Cloth, $2.60 New York, The Macmillan Company.

This volume is a revision of the lectures given during a great many years to students in Home Economics at the Iowa State College of Agriculture and Mechanical Arts. The first edition was published in 1912, and owing to many changes in point of view and development in the science of bacteriology a revision was called for. The Introduction deals with Historical Notes and Germ Theory of Fermentation, Decay and Disease. Section I comprises Morphology, Classification and Distribution of Microörganisms; Section II, Cultivation and Observation of Microörganisms; Section III, Physiology; Section IV, Fermentation or Zymotechnique; and Section V, Microörganisms and Health. The Appendix contains a Key to the Families and Genera of the Commoner Molds, an Authors' Index and a Subject Index. The book is written very clearly, and the text is elucidated with 360 illustrations. We can cheerfully recommend it to pharmaceutical students and to pharmacists, chemists and bacteriologists.

OTTO RAUBENHEIMER, Ph.M.

Colorimetric Analysis. By F. D. Snell. 16 illustrations, 150 pp. Cloth, $2.00. New York, D. Van Nostrand Company.

This comparatively new science consists of treating a solution of the substance to be tested with a reagent, in such a way as to produce a color which is proportional in intensity to the amount of the substance in solution. The methods are not only applicable to the determination of many metals but also to acid radicals and compound radicals to a limited extent. The test substances treated are Iron, Copper, Carbon in Steel, Lead, Bismuth, Arsenic, Aluminum, Chromium, Nickel, Cobalt, Manganese, Zinc, Potassium, Magne-

sium, Gold, Titanium, Vanadium, Tungsten, Fluorine, Chlorine, Perchlorates, Nitric and Nitrous Acids, Ammonia, Phosphorus, Silica, Boron, Oxygen, Hydrogen, Peroxide, Sulphur, Hydrogen Sulphide, Selenious Acid, Salicylic Acid, Cyanides, Water, Oils and Dyes. Truly enough material in such a small volume! We wish this little book and the new science the best of success.

OTTO RAUBENHEIMER, Ph.M.

Handbook of Laboratory Glass Blowing. By Bernard D. Bolas, with Numerous Diagrams by Naomi Bolas. 12mo. 106 pp. $1.50. New York, E. P. Dutton & Co.

This little book is an excellent treatise on the practical application of glass blowing in the laboratory. The many illustrations help the reader to understand the text. Students, pharmacists and chemists will be amply repaid by studying this book and making use of the knowledge herewith gained. The author deserves thanks, not only for the publication of this monograph but quite especially for giving the underlying reason for each detail of procedure. It is a little book well worth having in the laboratory.

OTTO RAUBENHEIMER, Ph.M.

The publishers, Harcourt, Brace & Co., New York City, have submitted the following two texts for review:

Fundamental Principles of Organic Chemistry. By Charles Moureu, Member of the Institute and of the Academy of Medicine and Professor at the Collège de France. Authorized translation from the 6th French Edition by Walter T. K. Braunholtz, B.A., A.I.C. Octavo, 399 pages.

The author, also a member of the Paris Faculty of Pharmacy, has lately received the degree D.Sc. *honoris causa* from the University of Montreal, for his chemical researches and for the numerous methods of application of chemistry in warfare which he effected during hostilities. No less an authority than Sir William J. Pope, the well-known Professor of Chemistry in the University of Cambridge, wrote a very interesting introduction to this book, in which he recommends it to English students.

The 7 chapters of the work comprise the following subjects: General Theories, Hydrocarbons, Functions containing O, Functions containing N, Organo-Mineral Compounds, Heterocylic Compounds and Dyestuffs. The chemical nomenclature proposed by the Geneva Congress in 1892 has been freely used in the original French edition, but, in view of the fact that it is only partially followed in the United States, the translator preferred to use the standard English nomenclature and enclosing some of the Geneva names in brackets.

It is to be hoped that the present edition will also be given a favorable reception, which it fully deserves.

Practical Biological Chemistry. By Gabriel Bertrand, Professor in the Faculté des Sciences and the Institut Pasteur, and Pierre Thomas, Assistant in the Faculté des Sciences and the Institut Pasteur. Translated from the 3rd Edition by Hector A. Colwell, M.B., D.P.H., joint author of "Radium, X-Rays and the Living Cell," late Pathologist to the 36th General Hospital, Salonika. Octavo, 348 pages.

Prof. Gabriel Bertrand is known as an authority on biological chemistry the world over. Those who were fortunate enough to see and hear him at the 8th International Congress of Applied Chemistry during September 1912 in New York City will surely never forget him. Besides his many papers read before this Congress, his general lecture "Sur le Rôle des Infiniment Petits en Agriculture," published in Vol. 28 of the Transactions, is a master work on the application of biological chemistry in agriculture.

During the past decades biological chemistry has made progress which may fairly be described as phenomenal. The composition and chemical relations of substances that play the principal part in metabolism have been elucidated, not only analytically but also synthetically. As a consequence, biological chemistry has advanced to the status of a definite branch of science, and now has its own specialists and laboratories, its own methods and literature.

Prof. Bertrand's "Guide pour les Manipulations de Chimie Biologique" is a standard, in fact, *the* standard work on this subject. The translator, Dr. Colwell, deserves credit and thanks, as he made this work available to the chemist who does not master French. It is with regret that we notice the expression "degrees Beaumé." It was Antoine *Baume*, and *not Beaumé*, the Paris apothecary and Professor at the College de Pharmacie, who invented the hydrometer scale, which still bears his name!

OTTO RAUBENHEIMER, Ph.M.

Organic Medicaments: Préparation des Médicaments Organiques. By E. Fourneau. 350 pp. Illustrated. Price 25 fr. (J. B. Baillière & Sons, Paris.)

There comes to the editorial table a volume entitled "The Preparation of Organic Drugs." Ernest Fourneau, head of the Pasteur Institute, member of the Academy of Medicine and director of the Poulenc Laboratories, is the author of this, one of the few books available for particulars as to the preparation of organic medicaments. There is no lack of detail in this volume such as is usual with others on this subject. Dr. Roux, director of the Pasteur Institute, has supplied a comprehensive preface in which he refers to the experience of Monsieur Fourneau in Madrid in practical laboratory demonstrations and in schools of pharmacy, and his theoretical and practical experience. These lessons are absolutely complete on every subject they touch. It is admitted that therapeutic researches are not greatly encouraged in France, the large number of new medicaments going to France from other countries. Monsieur Fourneau is convinced of the necessity of being independent of foreign lands for the important medicaments and in this volume has contributed much to incite young chemists to enter this work. The subject matter is divided into 2 parts: "Lessons" and "Practical Work." The first part of the book gives the rationale of the processes involved in the preparation of the organic compounds, and is clearly set out so that advanced students will have no difficulty in understanding. For example, in the first lesson relating to guaiacol the various steps in the preparation of orthonitrophenol are described, then the rules for nitration, other processes for preparing the nitrophenol, the methylation of pyrocatechin, and so on throughout this part of the book. The practical part describes the mounting of apparatus, with advice to beginners; many illustrations are given. This is followed by detailed accounts of the preparation of the various compounds, giving the quantities of reagents required, and full details as to manipulation. The yield is in nearly every case stated. The preparation of intermediate products is described with as much detail as the chief substance. The effect of a scanning of this work, which, by the way, is written in French, is to give the fingers and the brain instant occupation by following the formulas set down.

HELEN PITKIN SCHERTZ.

PUBLICATIONS RECEIVED.

The Story of Drugs. By H. C. Fuller. The *Centurion* states that this is a fascinating book on a subject rarely opened at all to laymen. The author is H. C. Fuller of the Industrial Research Laboratories, Washington, D. C. What drugs are and where they come from; "Farming for Medicines;" patent medicines; vaccines and serums; vitamines (engagingly entitled "The spirit-world of Medicine"); the question of "dope;" cosmetics; the medical rôle of alcohol—all these are discussed. The publisher is the Century Co., 353 Fourth Ave., New York City, and the price is $3.00.

The book has been written with the purpose in mind of giving the public a better understanding of drugs; considerable space is given to an exposition of the need of alcohol in pharmacy and pharmaceutical and chemical manufacturing in an effort to dissociate in the minds of the people such employment from that of beverage, a use that no longer is lawful. The author presents the matter from every standpoint, arguments relative to which our readers are informed and therefore only the following quotations are given:

"In the national prohibition law alcohol is classed as a liquor. Its manufacture, sale, and use is surrounded by a mass of regulation that causes much hardship and dissatisfaction to the legitimate users. . . . The unfortunate circumstance is that alcohol as a medium for the manufacture of drugs and medicine has to be treated as a liquor. . . . It ought to be made the subject of special provisions and methods of administration; its legitimate use facilitated and not hampered."

The table of contents indicates the subjects discussed: What drugs are and where they come from; Beginnings and accomplishments of the medicine industry; How medicines are made; The rôle of alcohol; Farming for medicine; Patent medicines; their place in the economy of the nation; Nature's gift to mankind; Vaccines and serum therapy; In the spirit world of medicine; Vitamines; Dope and not dope; Self-medication—the family medicine chest; Paint, powder, and rouge: the height of the complexion; Hay fever: the malady of strenuous America; Legislation and its effect on the drug business.

Some will not wholly agree with the views expressed by the author on "patent medicines" and the family medicine chest, but this is a book written for the laity, for those who use these preparations, and the author's reasoning will lead the reader to think about practices he has heretofore followed without reasoning. Still there was an opportunity, in our opinion not fully taken advantage of by the author,

of impressing the readers with need of judgment in taking and giving medicines. Also, the advisability of specifically mentioning medicinal agents may in some instances be questioned.

The book may in some respects be compared with those written on chemistry for the laity, it is interesting and informative, and will give the readers a better understanding of drugs, and regulations that apply to their sale and dispensing, and create for them a somewhat different viewpoint relative to the druggist's responsibilities and his aim to give best service in subserving the interests of society, and of the importance of pharmacy.

There are about one hundred illustrations relating to drug culture, manufacturing and subjects previously referred to by title, also half-tones of a number of pharmacists and others engaged in contributory activities. Family trees: "Coal tar" drugs and their ancestry, and the relation of alcohol to the medicine industry are interesting illustrations.

The author states: "The topics and the subject-matter making up this volume have been inspired by the interrogations and discussions that a scientist, actively engaged in his profession, has encountered during two decades of almost daily contact with professional men of high and low degree, and with the various zones of culture making up our citizen population.

"The work is not intended as a scientific treatise; in fact, that is exactly what has been avoided. The object has been to present, as far as possible, in plain every-day terms and phraseology a story of the various phases of the drug industry, based, as before stated, on the diversified inquiries of non-scientific persons."

Liquor Potassii Arsenitis. By H. A. Langenhan. Part of thesis submitted for the degree of Doctor of Philosophy, University of Wisconsin. Bulletin of the U. of Wis., Serial No. 1153; general series No. 936—A century of the United States Pharmacopoeia, 1820–1920.

The bulletin covers about sixty pages; the references are complete and important points are briefly discussed. Historical account of arsenic therapy is given and the chemistry of the arsenical solutions is searchingly considered. In the pages devoted to Fowler's Solution attention is given to the nomenclature and chemistry, and the preparation is the subject of thorough research from title and synonym to dose in the Pharmacopoeias of the century; sixteen text subjects are commented on. The appendix gives account of the patents covering Fowler's Solution and reports of Thomas Fowler, M.D.

The monograph may be obtained from the University of Wisconsin for 35 cents; it is needless to enlarge on its value for the library.

Proceedings of the Twenty-second Annual Meeting of the American Conference of Pharmaceutical Faculties, held in New Orleans September 5–6, 1921. The book contains the usual reports, list of membership, roster of officers and committees, papers, etc. A sketch of the late Prof. Henry Parr Hynson by Dr. John F. Hancock accompanies a picture of the deceased.

NEW PUBLICATIONS.

Elements of Fractional Distillation. By Clark Shove Robinson. International Chemical Series. 204 pp. Illustrated. Price, $2.50 net. McGraw-Hill Book Co., Inc., New York.

Equations: First Course in the Theory of Equations. By Leonard Eugene Dickson. 168 pp. 26 figures. Price, $1.75 net. John Wiley & Sons, Inc., New York.

Handbook of Laboratory Glass-Blowing. By Bernard D. Bolas. 106 pp. Illustrated. Price, $1.50. E. P. Dutton & Co., New York.

The Microscope. By Conrad Beck. 144 pp. Price, 2s. 6d. R. & J. Beck, Ltd., London.

Microscope, Its Design, Construction and Application. By F. S. Spiers, Editor. 260 pp. Illustrated. Price, $5.50. J. B. Lippincott Co., Philadelphia.

Organic Chemistry: Fundamental Principles of Organic Chemistry. By Chas. Moureu. Translated from 6th French edition by W. T. K. Braunholtz. 399 pp. Price, 12s. 6d. net. G. Bell & Sons, Ltd., London.

Perfumes, Essential Oils and Fruit Essence Used for Soap and Other Toilet Articles: A Concise and Practical Account, Including Their Chief Constants, Methods of Analysis, and Numerous Practical Recipes, for the Chief Perfuming Mixtures. By Geoffrey Martin. 145 pp. Illustrated. Price, $3.50. D. Van Nostrand Co., New York.

Physics: Essentials of Physics. By George Arthur Hoadley. Revised edition. 544 pp. Illustrated. Price, $1.60. American Book Co., New York.

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